Roadie HD+35K

SETUP GUIDE

020-100394-02

CHRISTIE®

Roadie HD+35K

SETUP GUIDE

020-100394-02

NOTICES

COPYRIGHT AND TRADEMARKS

© 2010 Christie Digital Systems USA, Inc. All rights reserved.

All brand names and product names are trademarks, registered trademarks or trade names of their respective holders.

REGULATORY

The product has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the product is operated in a commercial environment. The product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of the product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.

This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

이 기기는 업무용 (A 급) 으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이점을 주의하시기 바라며 , 가정 외의 지역에서 사용하는 것을 목적으로 합니다 .

GENERAL

Every effort has been made to ensure accuracy, however in some cases changes in the products or availability could occur which may not be reflected in this document. Christie reserves the right to make changes to specifications at any time without notice. Performance specifications are typical, but may vary depending on conditions beyond Christie's control such as maintenance of the product in proper working conditions. Performance specifications are based on information available at the time of printing. Christie makes no warranty of any kind with regard to this material, including, but not limited to, implied warranties of fitness for a particular purpose. Christie will not be liable for errors contained herein or for incidental or consequential damages in connection with the performance or use of this material.

The product is designed and manufactured with high-quality materials and components that can be recycled and reused. This symbol means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from regular waste. Please dispose of the product appropriately and according to local regulations. In the European Union, there are separate collection systems for used electrical and electronic products. Please help us to conserve the environment we live in!

Canadian manufacturing facility is ISO 9001 and 14001 certified.

WARRANTY

For complete information about Christie's limited warranty, please contact your Christie dealer. In addition to the other limitations that may be specified in Christie's limited warranty, the warranty does not cover:

(a) Damage occurring during shipment, in either direction.
(b) Projector lamps (See Christie's separate lamp program policy).
(c) Damage caused by use of a projector lamp beyond the recommended lamp life, or use of a lamp supplied by a supplier other than Christie.
(d) Problems caused by combination of the product with non-Christie equipment, such as distribution systems, cameras, video tape recorders, etc., or use of the product with any non-Christie interface device.
(e) Damage caused by misuse, improper power source, accident, fire, flood, lightening, earthquake or other natural disaster.
(f) Damage caused by improper installation/alignment, or by product modification, if by other than a Christie authorized repair service provider.
(g) For LCD projectors, the warranty period specified applies only where the LCD projector is in "normal use." "Normal use" means the LCD projector is not used more than 8 hours a day, 5 days a week. For any LCD projector where "normal use" is exceeded, warranty coverage under this warranty terminates after 6000 hours of operation.
(h) Failure due to normal wear and tear.

PREVENTATIVE MAINTENANCE

Preventative maintenance is an important part of the continued and proper operation of your product. Please see the Maintenance section for specific maintenance items as they relate to your product. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty.

1: Introduction

1.1 Safety Warnings and Guidelines 1-1
1.1.1 General Precautions 1-1
1.1.2 AC / Power Precautions 1-2
1.1.3 Lamp Precautions 1-2

2: Installation and Setup

2.1 Projector Quick Setup and Installation 2-1
2.1.1 Quick Setup 2-1
2.2 Projector Position and Mounting 2-6
2.2.1 Floor Mounting and Leveling 2-6
2.2.2 Tilting and Special Orientations 2-7
2.2.3 Hoisting and Stacking 2-8
2.3 Installing Lens, Lamp, and Cooling 2-11
2.3.1 Lens Installation 2-11
2.3.2 Install First Lamp 2-13
2.3.3 Liquid Cooling 2-14
2.3.4 Ventilation 2-14
2.4 Connecting Sources 2-14
2.4.1 RGB Signals 2-16
2.4.2 YPbPr Signals (Component Video) *2-17*
2.4.3 Composite Video 2-17
2.4.4 Dual SD/HD-SDI 2-18
2.4.5 Extra Video 2-19
2.4.6 Optional Inputs 2-19
2.5 Connecting the Ballast 2-19
2.5.1 Configuring the Ballast for Incoming AC 2-20
2.6 Basic Image Adjustment 2-20

3: Operation

3.1 Projector Basics 3-1
3.1.1 Air Filter 3-1
3.1.2 Breaker/Power Switch (ON/OFF) 3-2
3.1.3 Control Panel (Rear of Projector) 3-2
3.1.4 Handles 3-3
3.1.5 Channels for FredFrame™ 3-3
3.1.6 Security Locks 3-3
3.2 Using the Built-In Keypad or Remotes 3-3
3.2.1 Built-in Keypad 3-3
3.2.2 Standard IR Remote and Transmission 3-4
3.2.3 Wired IR Remote 3-4
3.3 Power-up Procedure/Checklist 3-5
3.4 Power-down Procedure 3-6
3.4.1 System Warnings/Errors 3-6

4: Troubleshooting

4.1 Power 4-1
4.1.1 Projector Does Not Power ON 4-1
4.2 Lamp 4-1
4.2.1 Lamp Does Not Ignite 4-1
4.2.2 Lamp Suddenly Goes OFF 4-1
4.2.3 Flicker, Shadows Or Dimness 4-2
4.2.4 LampLOC™ Does Not Seem to Work 4-2
4.2.5 LiteLOC™ Does Not Seem to Work 4-2
4.3 Calibrating the Lens Mount 4-3
4.4 Built In Keypad 4-3
4.4.1 Projector ON, but No Backlight on Built-In Keypad 4-3
4.5 Image Displays 4-3
4.5.1 Blank Screen, No Display of Image 4-3
4.5.2 Severe Motion Artifacts 4-3
4.5.3 Image Appears Vertically Stretched or 'Squeezed' into Center of Screen 4-4
4.5.4 The Projector is ON, but There is No Display 4-4
4.5.5 The Display is Jittery or Unstable 4-4
4.5.6 The Display is Faint 4-4
4.5.7 The Upper Portion of the Display is Waving, Tearing or Jittering 4-4
4.5.8 Portions of the Display are Cut OFF or Warped to the Opposite edge 4-4
4.5.9 Display Appears Compressed (Vertically Stretched) 4-4
4.5.10 Data is Cropped from Edges 4-5
4.5.11 Display Quality Appears to Drift from Good to Bad, Bad to Good 4-5
4.5.12 Display has Suddenly Froze 4-5
4.5.13 Colors in the Display are Inaccurate 4-5
4.5.14 Display is Not Rectangular 4-5
4.5.15 Display is "Noisy" 4-5

5: Specifications

5.1 Display 5-1
5.1.1 Panel Resolution and Refresh Rate 5-1
5.1.2 Achievable Brightness 5-1
5.1.3 Achievable Contrast Ratio 5-1
5.1.4 Colors and Gray Scale 5-1
5.1.5 Gamma 5-1
5.2 Lenses 5-2
5.3 Inputs 5-2
5.4 Control 5-2
5.4.1 Wired Remote (Converted from IR Remote) 5-2
5.4.2 IR Remote 5-2
5.4.3 Ethernet 5-3
5.4.4 RS-232 Serial Input 5-3
5.4.5 RS-422 Serial Input 5-3
5.4.6 GPIO Input 5-3

5.4.7 Control Port (From Ballast) 5-3
5.4.8 Ballast Ports 5-3
5.5 Power 5-4
5.5.1 Projection head 5-4
5.5.2 7 kW 3-Phase Ballast (38-814001-51) 5-4
5.6 Lamps 5-5
5.7 Safety 5-5
5.8 EMC Emissions 5-5
5.9 EMC Immunity 5-5
5.10 Operating Environment 5-5
5.11 Non-Operating Environment 5-6
5.12 Weight & Size 5-6
5.12.1 Standard Dimensions 5-6
5.13 Standard and Optional Components 5-7
5.13.1 Standard (Sold with Product) 5-7
5.13.2 Optional (Sold Separately) 5-7

1 Introduction

Every effort has been made to ensure the information in this document is accurate and reliable; however, due to constant research, the information in this document is subject to change without notice.

* *The serial number can be found on the license label located on the back of the projector.*

NOTES: 1) *Only personnel trained specifically by Christie on lamp replacement and lamp safety may handle the lamp.* **2)** *Only Christie accredited service technicians knowledgeable about all potential hazards associated with high voltage, ultraviolet exposure, and high temperatures generated by the lamp and associated circuits are authorized to a) assemble/install the projector and b) perform service functions inside the projector.*

1.1 Safety Warnings and Guidelines

This projector is designed for safe and reliable operation. However safe operation is not assured by design alone; installers, service technicians, trained operators and all other users must maintain a safe environment at all times. Please read through and understand all warnings and precautions before attempting to operate the projector.

1.1.1 General Precautions

⚠ DANGER **Never look directly into the projector lens or at the lamp. The extremely high brightness can cause permanent eye damage. For protection from ultraviolet radiation, keep all projector housings intact during operation. Protective safety clothing and safety goggles are recommended when servicing. Keep hands, clothes and all combustible material away from the concentrated light beam of the lamp. Position all cables where they cannot contact hot surfaces or be pulled or tripped over.**

NOTES: 1) *The American Conference of Governmental Industrial Hygienists (ACGIH) recommends occupational UV exposure for an 8-hour day to be less than 0.1 microwatts per square centimeters of effective UV radiation. An evaluation of your workplace is advised to assure employees are not exposed to cumulative radiation levels exceeding the government guidelines for your area.* **2)** *Be aware that some medications are known to increase sensitivity to UV radiation.*

This projector must be operated in an environment that meets the operating range specification, as listed in *Section 5 Specifications*.

⚠ WARNING **Fire Hazard**. *Keep hands, clothes, and all combustible material at least 1m away from the concentrated light beam of the lamp.*

⚠ WARNING *Position all cables where they cannot contact hot surfaces or be pulled or tripped over.*

This projector must be installed in an environment that meets the operating range specifications in Section 6, Specifications.

⚠ WARNING *Opening or removing a projector cover requires a Christie accredited service technician.*

1.1.2 AC / Power Precautions

⚠ WARNING **Do not attempt operation if the AC supply is not within the specified voltage range.**

⚠ WARNING **Shock Hazard**. *Disconnect projection head and Ballast from AC before opening any enclosure.*

Do not allow anything to rest on the power cords. Locate the projector where cords cannot be abused by persons walking on it or objects rolling over it. Never operate the projector if a power cable appears damaged in any way.

Do not overload power outlets and extension cords as this can result in fire or shock hazards.

NOTE: *Only a Christie accredited service technician is permitted to open any enclosure on the product, and only if the AC has been fully disconnected from the projection head and Ballast.*

1.1.3 Lamp Precautions

Xenon arc lamps are under high pressure and must be handled with great care at all times. Lamps may explode if dropped or mishandled.

Wear Protective Clothing

Never open the lamp door unless you are wearing authorized protective clothing such as that included in a Christie Protective Clothing Safety Kit #598900-095. Recommended protective clothing includes, but may not be limited to, protective gloves, latex lab gloves, double-layer 0.040" acetate face shield, and a quilted ballistic nylon jacket or a welder's jacket. The face shield is provided with the projector.

⚠ WARNING **Explosion Hazard**. *Wear authorized protective clothing whenever the lamp door is open!*

⚠ WARNING *Never attempt to remove the lamp directly after use. The lamp is under increased pressure when hot and may explode, causing personal injury and/or property damage.*

NOTES: 1) *Christie's protective clothing recommendations are subject to change.* **2)** *Any local or federal specifications take precedence over Christie recommendations.*

Cool the Lamp Completely

The arc lamp operates at a very high pressure that increases with temperature. Failure to allow the lamp to sufficiently cool prior to handling increases the potential for an explosion causing personal injury and/or property damage. After turning the lamp off (powering down), it is crucial that you wait at least 10 minutes before turning OFF the breaker/power switch, disconnecting AC, and opening the lamp door. This provides enough time for the internal lamp cooling fans to properly cool the lamp. Cool completely before handling. Again, always wear Christie-approved protective clothing!

⚠ WARNING *Never attempt to access the lamp while it is on. Wait at least 10 minutes after lamp shut-off before powering down, disconnecting from AC, and opening the lamp door.*

⚠ WARNING **SHOCK HAZARD**. *Disconnect projection head and Ballast from AC before opening the lamp door.*

For all other precautions critical for safe removal and replacement of the lamp, see ***Section 4, Maintenance*** in the ***Roadie HD+35K User Manual***.

2 Installation and Setup

This section explains how to install, connect and optimize the projector. Illustrations are graphical representations only and are provided to enhance the understanding of the written material.

2.1 Projector Quick Setup and Installation

Follow these steps for quick setup of the projector in a basic front-mount position.

⚠ DANGER ***Always power down the projector and disconnect all power sources before servicing or cleaning.***

⚠ CAUTION ***Disconnect AC Mains in case of an emergency by pulling the line cord from the wall or the projection head. See Figure 2-1.***

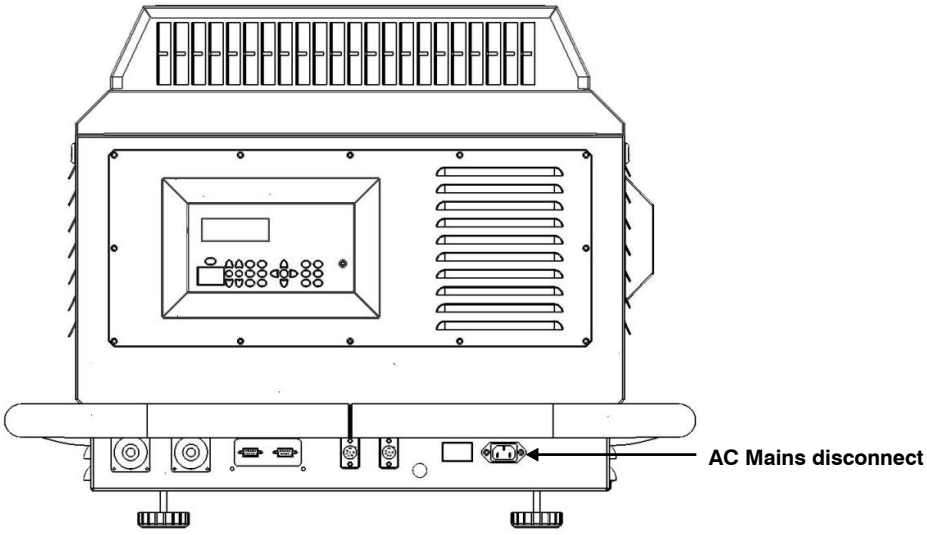

Figure 2-1 AC Mains Disconnect

⚠ WARNING ***Refer to Section 1.1 Safety Warnings and Guidelines.***

2.1.1 Quick Setup

1. **Position the Projection Head.**
   - Locate the projection head at an appropriate throw distance (projector-to-screen distance) and vertical position. See *Section 2.2 Projector Position and Mounting*, the Roadie HD+35K Throw Distance Technical document available on the Christie Website, PN 020-100395-XX, and *Section 5.2 Lenses*.
   - Ensure the projector is level from side-to-side, and not inverted. The projector's front-to-back and side-to-side tilt can be no more than 15° from horizontal.
   - Position the Ballast so that its four cables can reach the rear of the projection head.

2. **Install the Lamp and Lens.**

   Refer to *Section 2.3 Installing Lens, Lamp, and Cooling* for installation instructions.

3. Connect the source to the appropriate connector(s) on the main Input panel (lens side of the projector), shown in *Figure 2-2*.

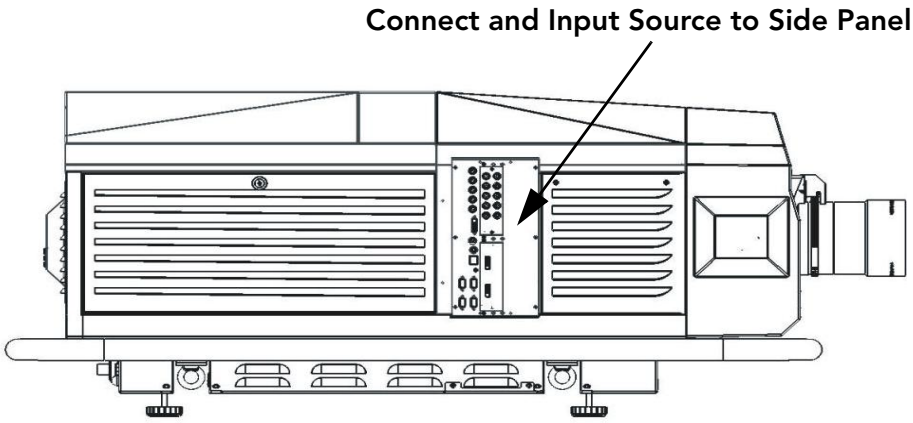

Figure 2-2 Connect to Input Panel

4. **Connect to Ballast and Power.**

⚠ WARNING ***1)*** Connect all four cables to the projection head prior to turning the breaker/power switch ON. ***2)*** Follow all labeling exactly.

Head to Ballast

Connect all four ballast cables (*Figure 2-3)*:

- 2 DC power cables
- 2 communication/control cables

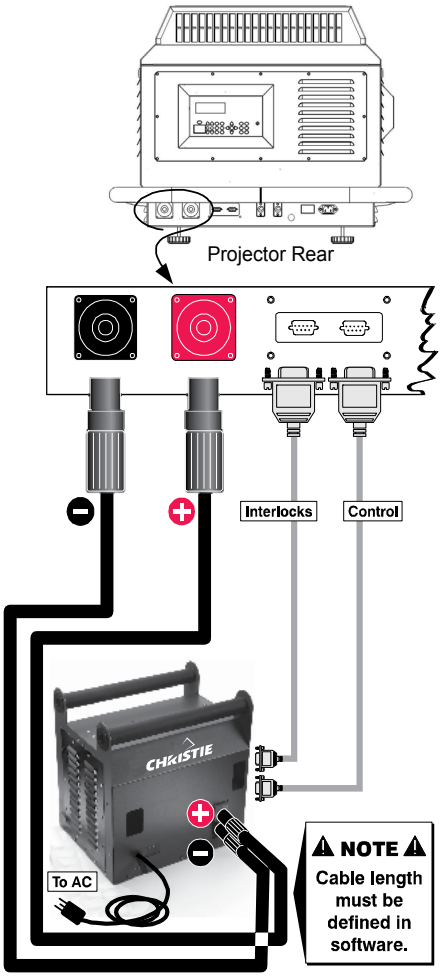

Figure 2-3 Connect Head to Ballast

Ballast to AC

Refer to *Figure 2-4*.

NOTE: *Before connecting the ballast to the AC, a Christie accredited service technician must ensure the ballast's plug type and Input Power Range Switch matches the line voltage available at the site. Remove the Ballast cover to access the breaker/power switch and determine it's setting. Toggle LEFT for 200 VAC supplies and RIGHT for 400 VAC supplies (factory default=200 VAC). Change the Ballast's plug type as necessary, as a delta load with safety ground has no neutral.*

- Connect the ballast's integral three-phase 30-amp line cord to AC according to your site.
- Confirm the ballast's three-phase status lights are ON and the adjacent voltmeter displays an acceptable AC level for your ballast, and region. Refer to *Section 5 Specifications* for details.
- Set the breaker/power switch to ON. Listen for the internal cooling fan to start-up.

NOTE: *There is no other indication of "ballast ON" status.*

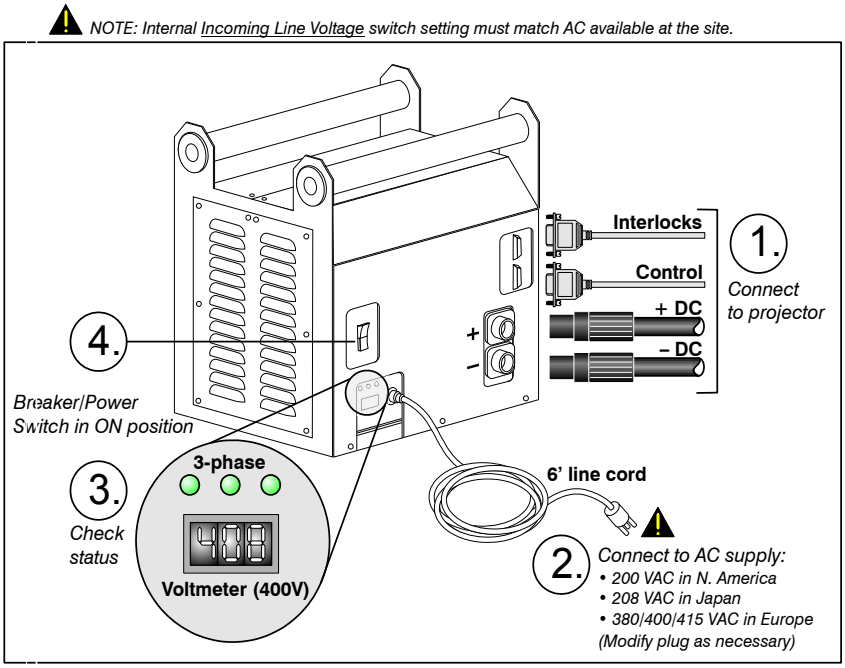

Figure 2-4 Ballast Connection and Breaker/Power Switch ON

Head-to-AC

Connect the Christie-supplied IEC 320 (220V) 15-amp line cord to AC (*Figure 2-5)*. *Do not substitute other cords*. Input power required is 200 - 240 VAC (nominal), 50/60 Hz @ 3A for 208V.

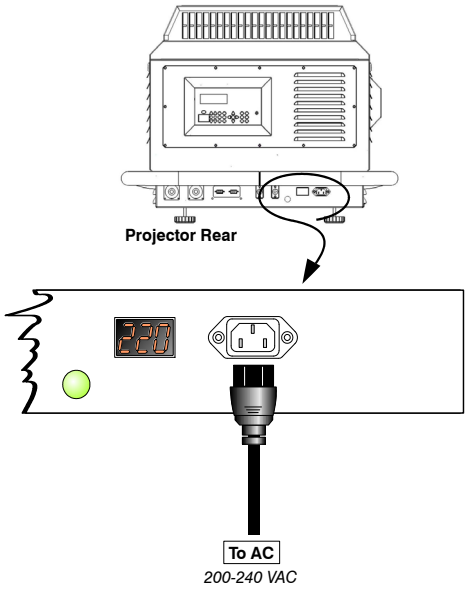

Figure 2-5 Connect Head to AC

⚠ WARNING ***Do not attempt operation if the AC level is not within the specified voltage, and power range for the projection head.***

At this point, the projection head is in "standby" mode only. The voltmeter displays the incoming voltage, the adjacent main PROJ. STATUS light yellow, and the light engine compartment fans running. The rest of the projection head should be OFF.

5. Before switching the projector ON and igniting the lamp, define which size lamp is installed to avoid severely over driving or under driving a lamp.

⚠ WARNING ***Explosion hazard. Keep the projection head OFF until you have defined which lamp type is installed.***

a. Press MENU. The Status Display at the rear of the projector displays a "Lamp Size" of 2000, 3000, 4500 or 6000 watts, depending on its last setting (factory default=6000).

b. Enter the Lamp password. See *Figure 2-6*.

NOTE: *The password is required unless the "Enable Password" service option has been turned OFF.*

c. Press POWER and use the UP ARROW to locate and select which lamp is currently installed.

d. When the Status Display shows the correct lamp type, the projector and lamp can be switched ON. Ensure the lamp type is also indicated on the lamp door label. If not, record with a sticker or dry erase marker.

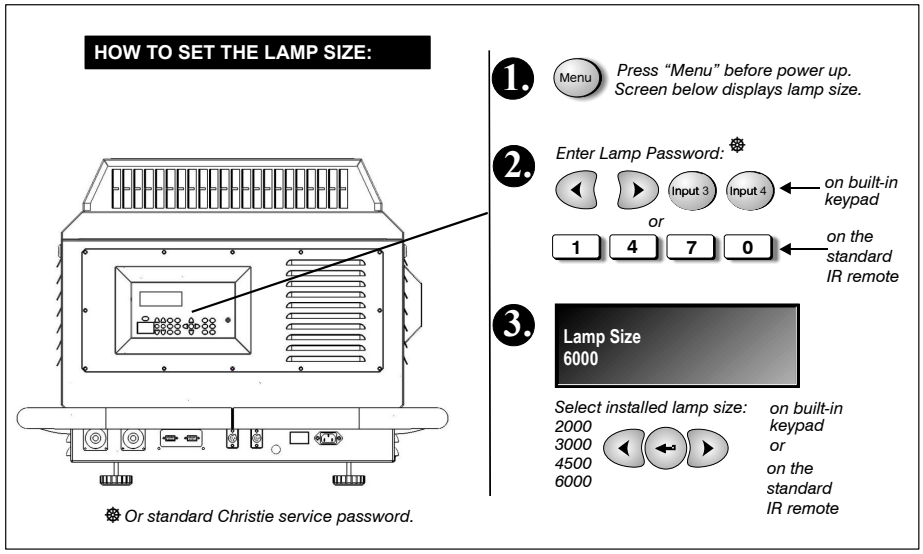

Figure 2-6 Setting Lamp Size

Once the Status Display shows the correct lamp type, the projector and lamp can be switched ON.

NOTE: *Lamp size can also be changed in the Service menu (Service password required) if the projector is running, but it will not take effect until the next power-up. Whenever possible, define the lamp size* ***before*** *igniting the lamp.*

6. Using either the built-in keypad or the standard IR remote, do one of the following to switch the projector ON, and ignite the lamp:

- press and hold POWER for at least two seconds

- press POWER, and then press the UP or DOWN Arrow key (useful if you are unsure of the present state of the projector)
- press POWER twice quickly to toggle from the projector's present ON/OFF state

The main PROJ. STATUS light at the rear of the projector should be green when the projector is up-and-running. For best results, let the projector warm up for about 5 minutes.

7. Using either the standard IR remote or built-in keypad, press the appropriate **Input** key (1-6) to display the image for the corresponding source connected (see Step 3). The display resizes to produce an image as large as possible for the type of source present.
8. Adjust the more common image settings (Brightness, Contract, Gamma, etc.) using keys on the standard IR remote.

   Press MENU on the remote to access the Menu system to adjust image settings.
9. **Adjust the lens.**
   - Use the **Focus** button on the standard IR remote or the built-in keypad to focus the image.
   - Use the **Zoom** buttons to increase or decrease image size (not available with fixed 0.8:1 and 1:1 lenses). Use the **Lens Shift** button, and ARROW keys to shift the image location.

   Refer to ***Section 3.14 Working with the Lenses*** in the ***Roadie HD+35K User Manual***.
10. In the *Lamp* menu, set the "Cable Length (m)" slidebar to match the length of the high-voltage DC cables connected between your ballast and projection head. This regulates the voltage drop that occurs over distance, and ensures that adequate voltage reaches the lamp. For rental/staging type installations, this setting may need to changed from its last use. The adjustment range is 2-30m (6½-100 ft.).

    Setting the "Cable Length" also allows you to achieve the same lumens, regardless of cable length. To drive the lamp at maximum power, even with shorter ballast cables, set "Cable Length" to maximum power. Due to resistance losses that occur with longer ballast cables, the ballast does not achieve the same maximum power.
11. Press AUTO SETUP and/or MENU to refine other display parameters as necessary. Refer to ***Section 3.14 Working with the Lenses*** in the ***Roadie HD+35K User Manual***.

2.2 Projector Position and Mounting

Installation type, the available screen, and ambient lighting all affect where the projector should be positioned. In addition, both throw distance (the distance between the projector and screen) and vertical position (the height of the projector in relation to the screen) must be determined for every new installation. Both depend on the screen size and lens type you are using. Ensure the room can accommodate the required location of the projector for the chosen screen size.

For more information about the Roadie HD+35K lens throw ratio calculations, refer to the ***Roadie HD+35K Throw Distance Technical Document*** available on the ***Christie Website, PN 020-100395-XX***.

2.2.1 Floor Mounting and Leveling

For front projection without suspending, mount the projector on a strong supporting structure or cart. If using a mobile cart, avoid sudden stops, force, and uneven surfaces that may cause the top-heavy cart to lurch and overturn.

Make sure your mounting structure is reasonably level, and then adjust one or more projector feet as necessary to fine-tune.

⚠ WARNING *Do not invert this projector.*

Adjusting the Feet

For installations on a floor or suitable supporting structure, a single projection head should rest firmly on its feet. To adjust the height and level of the projector, extend or retract the feet by rotating them. See *Figure 2-7*.

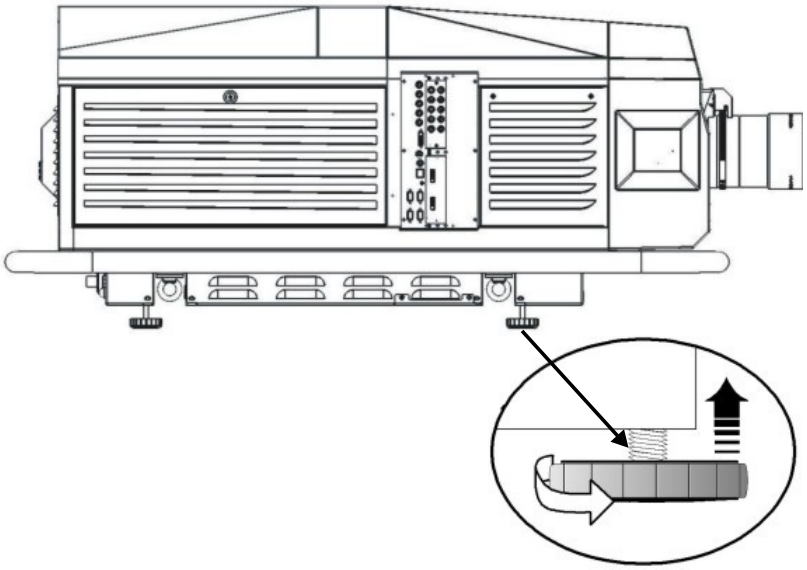

Figure 2-7 Adjusting the Feet

2.2.2 Tilting and Special Orientations

Tilting

For any installation, you can tilt the projector up, down or side-to-side as much as 15° (see *Figure 2-8*). This limit ensures safe lamp operation and proper position of the liquid cooling reservoir in the projector.

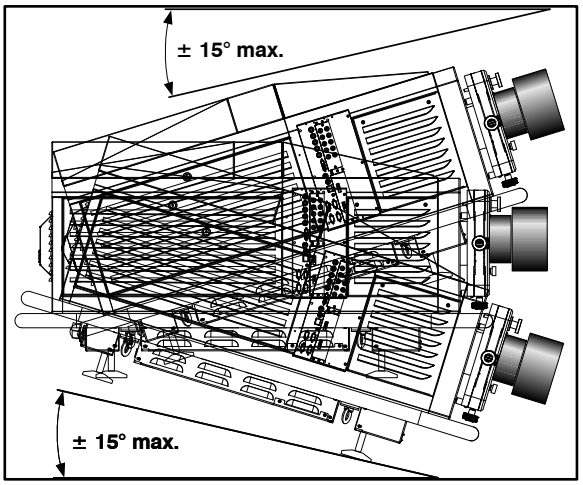

Figure 2-8 Front End Tilt

⚠ WARNING ***Tilt only as shown in Figure 2-8 and Figure 2-9.***

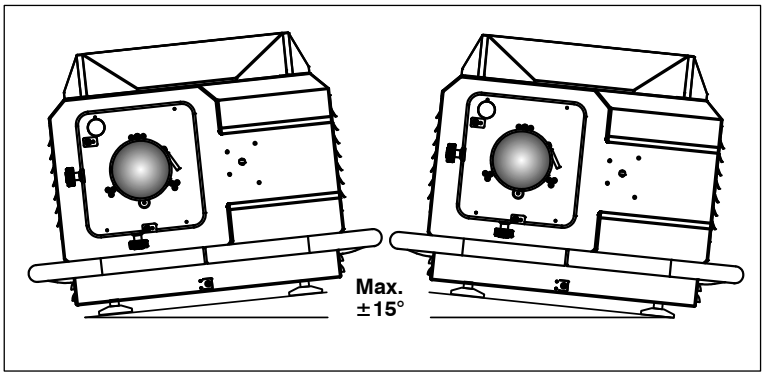

Figure 2-9 Side to Side Tilt

Special Orientations

Since this projector cannot be inverted or tilted beyond 15°, all installations are typically front or rear-mounted, and requires the orientation of the "Front" or "Rear" image to be set in the *Configuration > Image Orientation* menu option.

2.2.3 Hoisting and Stacking

For most installations, you will likely have to safely lift or hoist this projector-or a stack of two projectors-into place. Keep in mind the following critical safety guidelines for all handling of the projector.

Carrying/Moving the Projection Head

Four or more people can lift and hand-carry one projection head a short distance using the handles or the optional FredFrame™, if installed. **NEVER** carry a stack of projectors.

Hoisting/Rigging a Single Projection Head

A single projection head can be hoisted and/or suspended using its handles, a set of rigging clamps (#113-102101-xx), and appropriate rigging and safety cables. If desired, the lamp ballast can also be flown from its integral rigging bars. To hoist, stack or "fly" a stack of projectors you must use the optional ***FredFrame™***. Refer to *Using the FredFrame™* described below.

Read the following safety warning before hoisting/ rigging ONE projection head. Refer to 020-100133-XX for more information.

⚠ DANGER ***Any overhead suspension used MUST be suitably rated for the weight of the projector. The projector's weight is 435 lb / 197.3 kg.***

⚠ WARNING ***Maximum load rating of the projector's handles is 435 lb / 197.3 kg. Use straps and/or cabling with load capacity adequate for the total projector and handles when lifting/hoist. Never exceed the load rating specified.***

⚠ WARNING ***Use the projector's handles for hoisting/rigging ONE projector only. Never try to carry more than one projector.***

⚠ WARNING ***Remove the projection lens before hoisting/rigging.***

When hoisting/rigging a single projector using its handles, do the following:

1. Remove the projection lens. Refer to ***Section 4.5, Replacing a Lens*** in the ***Roadie HD+35K User Manual***.
2. Clamp the 4 rigging clamps to the projector's handles staying within the assigned rigging zones. Refer to *Figure 2-10* and *Figure 2-11*, and allow a minimum of 12 inches between clamps for proper stability. Do not tighten the cross bolt of the clevis arms to ensure the rigging clamp can swivel freely.

NOTE: *Symmetrical placement of the clamps on each side of the handles is strongly recommended.*

3. Secure the other end of each clamp to the primary support structure.
4. Secure the projector with an additional two safety straps. Using one safety strap per crossbeam, route the strap through the bottom 2 eyebolts and bring them up, and around the outside of the handles. Refer to *Figure 2-11*.
5. Install the projection lens and secure it with the safety ring and tether strap as described in *Section 2.3 Installing Lens, Lamp, and Cooling*.

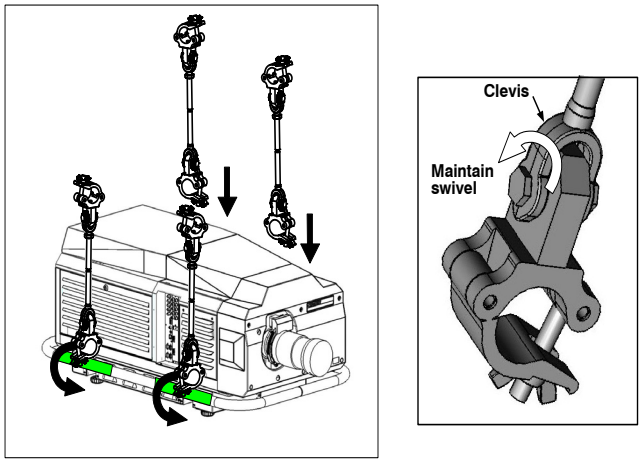

Figure 2-10 Securing Clamps to Projection Head

⚠ WARNING ***1) CRITICAL SAFETY is a minimum of 4 rigging clamps are required for a single projector. 2) Always use redundant safety straps/cables. 3) Observe load ratings and all local applicable codes.***

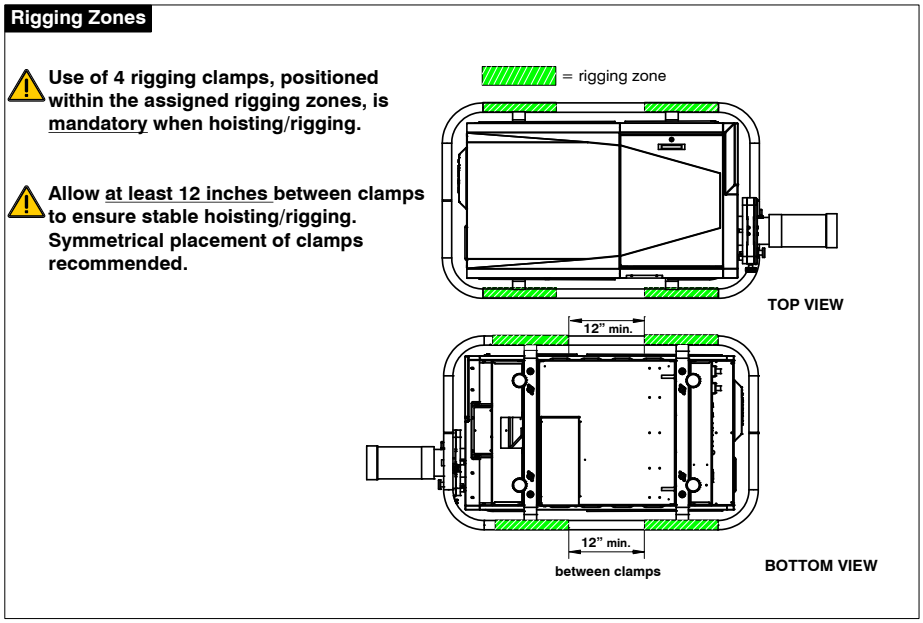
Rigging Zones
Use of 4 rigging clamps, positioned within the assigned rigging zones, is mandatory when hoisting/rigging.
Allow at least 12 inches between clamps to ensure stable hoisting/rigging. Symmetrical placement of clamps recommended.
= rigging zone
TOP VIEW
12" min.
12" min.
between clamps
BOTTOM VIEW

Figure 2-11 Rigging Zones on Projector Handles

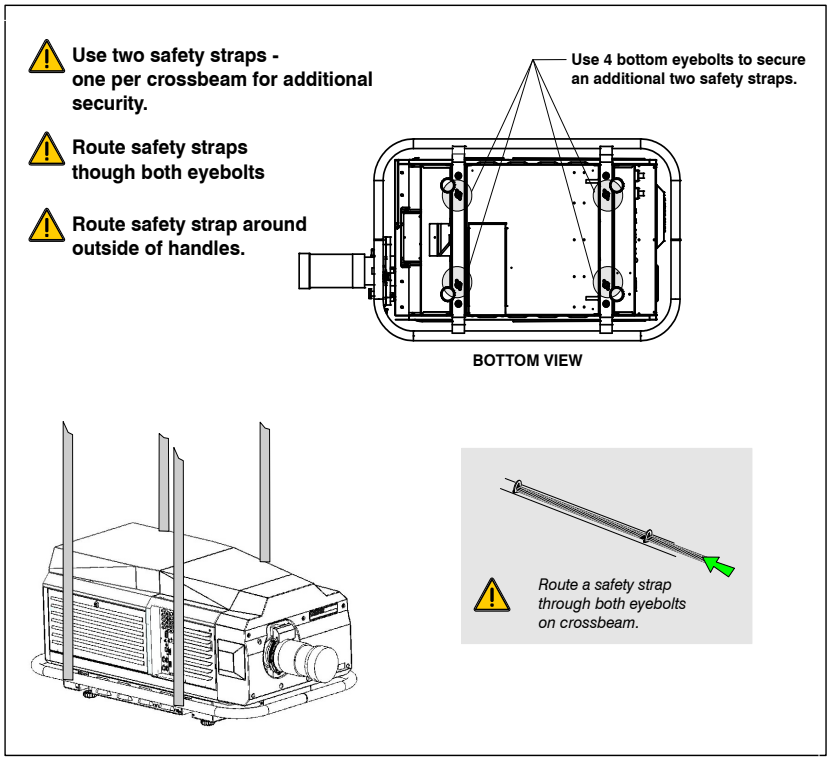
Use two safety straps - one per crossbeam for additional security.
Route safety straps though both eyebolts
Route safety strap around outside of handles.
Use 4 bottom eyebolts to secure an additional two safety straps.
BOTTOM VIEW
Route a safety strap through both eyebolts on crossbeam.

Figure 2-12 Using Safety Straps

Using the FredFrame™

To hoist, stack and/or "fly" projectors using the optional FredFrame™ (PN 38-814007-XX), you must first remove the handles and properly secure each projection head within a FredFrame™. Then using appropriate rigging clamps (included with FredFrame™ or 113-102101-XX), you can raise and/or suspend the projector assembly. If desired, the lamp ballast can also be hoisted and flown from its integral rigging bars. Follow the instructions provided with the FredFrame™ kit.

⚠ WARNING ***1) Use straps and/or cabling with load capacity adequate for the total projection head and frame weight. 2) Remove the lens before hoisting. 3) Critical safety means to never exceed the Load Rating specified in the FredFrame™ Stacking & Rigging Kit instructions.***

Refer to the complete instructions for using the FredFrame™. These include all installation instructions as well as mechanical adjustment procedures for proper image alignment.

Using a Fork Lift

⚠ WARNING ***Do not attempt to use a forklift without first installing the forklift rails on the bottom of the FredFrame™, otherwise the base of the projector may crush and damage internal components.***

Strong extruded rails that mount to the bottom of the FredFrame™ accommodate forks from a forklift, and are mandatory for this method of transport. Do not lift the projection head with equipment unless the FredFrame™ and forklift rails are installed. The projector's handles must be removed when installing the FredFrame™. Follow the instructions provided with the FredFrame™ kit.

Stacking

To stack two projection heads together, you must first secure each head within a FredFrame™, and then secure all corners of the frames together using 4 stacking pins (provided). Do not stack more than 2 projection heads together, and do not attempt to move stacked projectors without proper transport equipment. Refer to the instruction provided with the FredFrame™ Kit for stacking.

2.3 Installing Lens, Lamp, and Cooling

It is recommended that the lens and lamp installation be handled at the last possible moment to ensure that no damage is done to the projector due to movement.

2.3.1 Lens Installation

Primary Lens

1. Remove the rear lens cap from the lens.
2. Rotate the lens clamp to the **OPEN** position.
3. Orient your primary lens with its **UP** label at the top and fully insert the assembly straight into the lens mount opening all the way back, without turning.

NOTES: 1) *Ensure that the Zoom connector is fully engaged.* **2)** *When installing the lens, ensure that the lens is* ***NOT*** *inserted at an angle, as this can cause damage.* **3)** *Ensure that the lens is fully back to seat properly within the lens mount.*

The following steps are **IMPORTANT!** and necessary to ensure your safety and that the lens does not fall out.

4. Lock the lens assembly in place with the lens clamp **DOWN**.
5. For added security, tether the lens to the projector by wrapping it around either the handle or FredFrame™ if flown. This step is not required if the projector is floor-mounted.

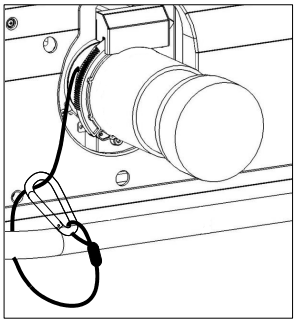

Figure 2-13 Tether Lens to Projector

⚠ DANGER ***In the event a lens is dropped, the lens tether and clamp assembly may become stressed, and therefore must be replaced before continuing its use. Failure to do so could result in injury or death.***

6. Remove the front lens cap.
7. Calibrate the lens. See *Figure 2-14*. For more information, refer to ***Section 3, Operation*** in the ***Roadie HD+35K User Manual***.

⚠ CAUTION **Lens calibration must be performed each time a new lens is inserted or after performing manual lens mount adjustments. This is critical to the projector functioning properly. Failure to do so could result in damage to the lens mount, the projector, or the projection lens.**

To calibrate the lens, select the *Configuration > Diagnostics and Calibration > ILS Calibration > Reference Calibration* option from the *Main* menu. This allows the lens to find the center points of each axis (focus, zoom, horizontal, and vertical), the end stops, and other motion parameters.

NOTE: *Failure to calibrate the lens can cause damage to the lens mount.*

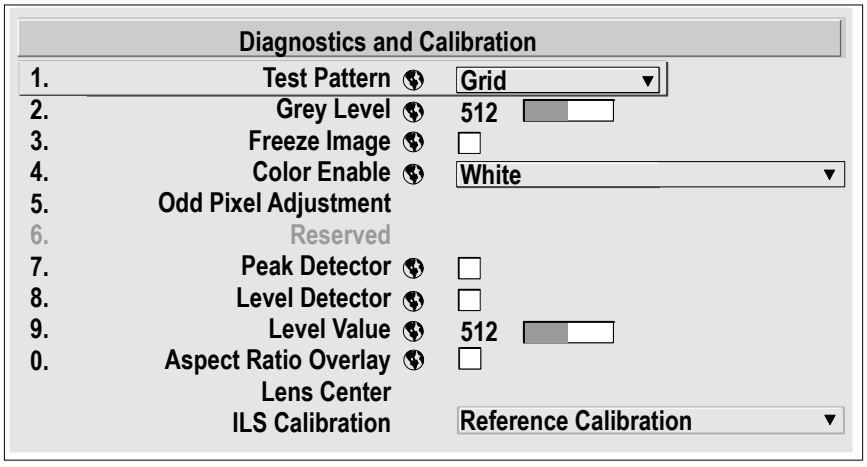

Figure 2-14 Diagnostic and Calibration Menu

Lens Center Command

This command moves the lens horizontal and vertical motion to the center of travel.

NOTES: 1) *The lens seals the projection head, preventing contaminants from entering the area of main electronics. Never attempt to operate the projector without a lens installed. During transport and installation, install a lens plug.* **2)** *Always re-install a lens in its previous "UP" orientation, otherwise boresight may require re-adjustment.*

Anamorphic Lens Installation (Optional)

NOTE: *The optional anamorphic lens mount is required for use of the 1.26x anamorphic lens, producing 2.39:1 "scope" images. However, the lens mount cover must be removed when installing the anamorphic lens mount and in order to the use the MALM.*

If the anamorphic lens is used, it is recommended that you add the lens and its mount before final leveling or making any adjustments (i.e. boresight, etc.). Install only for those installations requiring full-size 2.39:1 "scope" display (mostly side-masking screens) obtained by optically stretching a pre-squeezed image.

1. **Install the Anamorphic Lens Mount on the Projector.**

   At the front of the projector, install the anamorphic lens mount hardware as described in the instructions provided with *Christie's Anamorphic Lens Mount Kit*.

2. **Install the 1:26x Anamorphic Lens.**

   Clamp the 1.26x anamorphic lens mount in place, following the instructions provided with the anamorphic lens mount kit.

2.3.2 Install First Lamp

⚠ WARNING **Explosion Hazard**. *Wear authorized protective clothing whenever the lamp door is open! Never apply a twisting or bending force to the quartz lamp body. A Christie accredited service technician is required.*

1. Open the lamp door and remove lamp cooling compartment door.

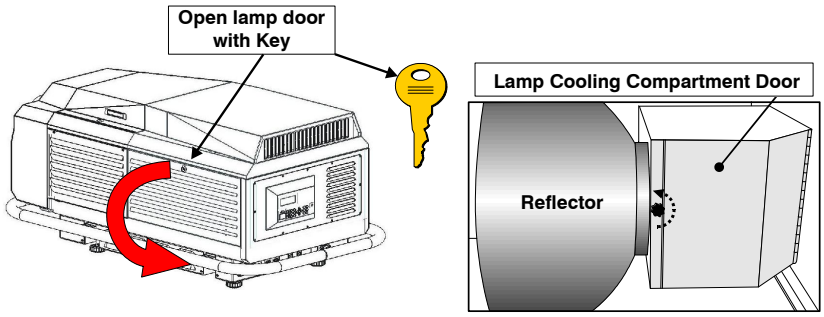

Figure 2-15 Open Lamp Door and Cooling Compartment

2. Install one of the following lamps in the projection head, depending on your model and site:
   - 2.0 kW*
   - 3.0 kW*
   - 4.5kW*
   - 6.0 kW*

NOTE: *3-phase ballast is required.*

* Available as CDXL (maximum performance) or original CXL.

Refer to *Section 5 Specifications.*

1. **Check lamp cradle (Anode end) location for your lamp.**
   - For 4.5 or 6.0 kW lamps, the lamp cradle should use the holes farthest from the reflector (factory default).
   - For 2.0 or 3.0 kW lamps, use the holes closest to the reflector.
2. **Install lamp.**

   Refer to ***Section 4.2 Replacing the Lamp & Filter*** in the ***Roadie HD+35K User Manual***.

NOTES: 1) *Observe all warnings, and wear protective clothing and shielding.* **2)** ***Do Not*** *forget to properly mark the "Lamp Installed" label on the lamp door to indicate current lamp size.*

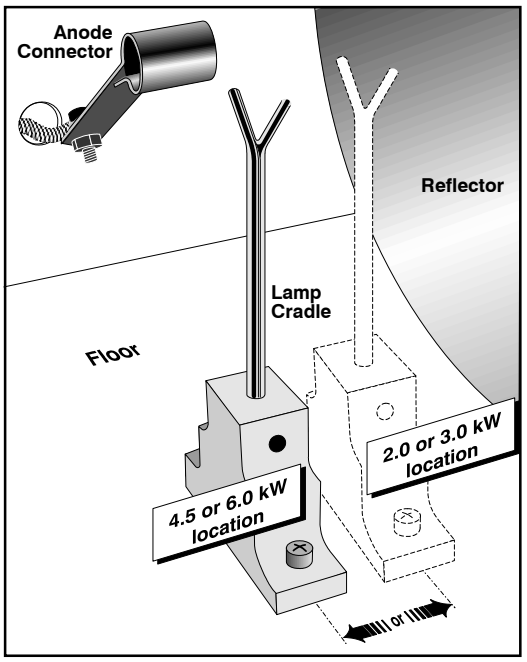

Figure 2-16 Move cradle back for 2.0 or 3.0

2.3.3 Liquid Cooling

During operation, a closed loop of flexible tubing circulates liquid coolant from a small reservoir to critical electronic components located near the front of the projection head. The coolant (a 50/50 mix of distilled water and ethylene glycol) should fill approximately half of the reservoir to ensure adequate circulation. The reservoir, which is located in the Igniter compartment, is factory-filled and does not require draining for transit. Check regularly.

2.3.4 Ventilation

Vents and louvers in the projector covers provide ventilation, both for intake and exhaust. Never block or cover these openings. Do not install the projector near a radiator or heat register, or within an enclosure.

2.4 Connecting Sources

Sources connect to the Input Panel located on side of the projector closest to the lens. Refer to *Figure 2-17*.

The upper left corner (**INPUT 1**) typically accepts an RGB signal from an external analog RGB source, or it can also be used for YPbPr signals. Just beneath these BNCs, the DVI-I connector (**INPUT 2**) accepts digital or analog display signals from a computer. An HDMI to DVI adapter cable accepts digital signals from a Blu-Ray or DVD player. Connect analog composite video at **INPUT 3** or S-video at **INPUT 4** from devices such as VCRs or DVD players. At **INPUT 5,** connect serial digital YCbCr (4:2:2) or compatible SMPTE signals (note this module can be moved to **INPUT 6.** if desired).

There are also several optional interfaces available for connecting other sources, these interfaces slide into either Input 5 or Input 6, and can be removed or installed while the projector is running.

NOTE: *Some Input options are not available with some projector models.*

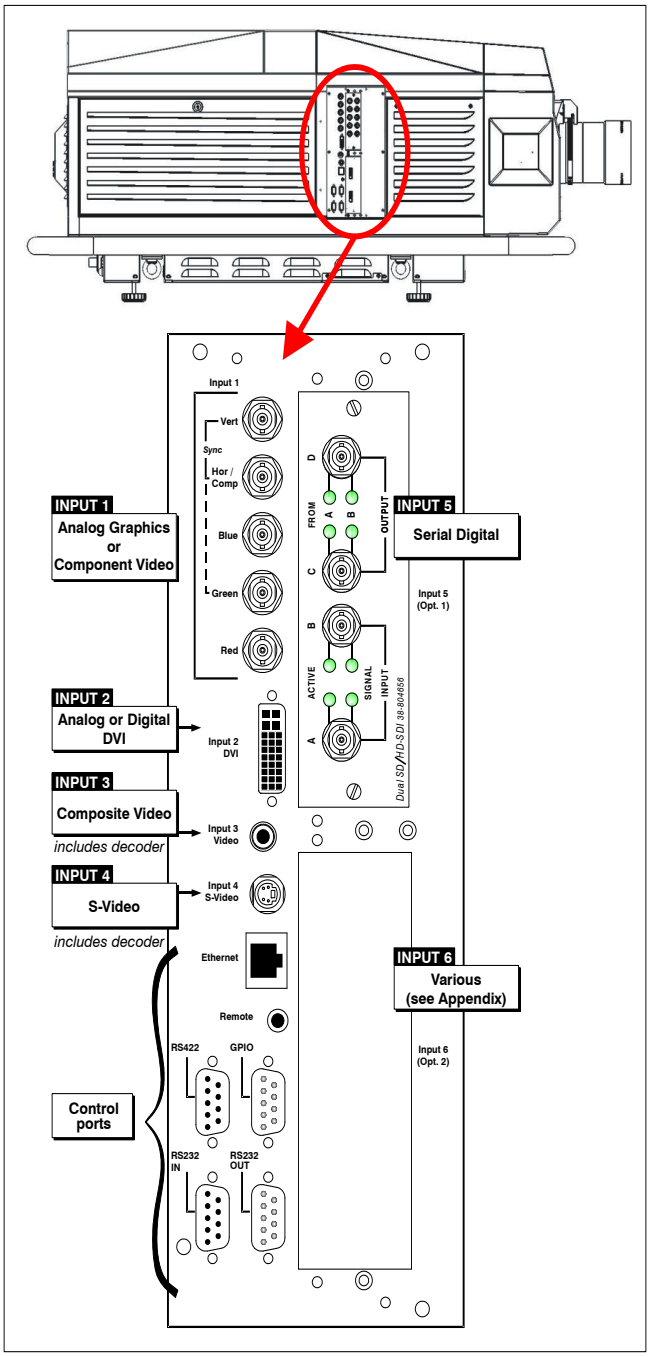

Figure 2-17 Roadie HD+35K Input Panel

NOTES: 1) *Refer to Section 5 Specifications for details regarding compatible inputs.* **2)** *Use only high-quality shielded cables for all connections.*

2.4.1 RGB Signals

INPUT 1 consists of five BNCs (connectors) for linking to a variety of sources. The typical connection would be to an RGB source such as a PC, Mac, DEC, Sun, SGI and others. This projector supports multiple sync types with RGB signals: sync-on-green, composite sync, and separate H & V syncs.

NOTE: *Depending on your source, you may need a custom adapter cable with BNC connectors at the projector end and a different type of connector at the other (such as a 15-pin "D" connector for some computer sources). Contact your dealer for details.*

Connect the **SYNC** BNC input(s). Then connect the red, green and blue source outputs to the **RED**, **GREEN**, and **BLUE** BNCs on the **INPUT 1** panel. If the source uses sync-on-green, only the red, green, and blue connections are required. If the source provides a composite sync output, connect it to the **SYNC** input labeled **HOR/COMP**. If the source provides separate horizontal and vertical sync outputs, connect horizontal sync to the **SYNC** input labeled **HOR/COMP** and connect vertical sync to **SYNC** input labeled **VERT**. See *Figure 2-18*. Connecting an RGB Source.

NOTES: 1) *If for some reason the projector fails to recognize a signal as an RGB signal, specify this Color Space option within the Image Settings menu. Refer to* ***Section 3.6.3 Image Settings Menu*** *in the* ***Roadie HD+35K User Manual****.* **2)** *To connect YPbPr signals-such as from DVDs or analog HDTV sources-to INPUT 1, use the red, green and blue BNCs as described in YPbPr Signals (below).* **3)** *This input does not route to the decoder and cannot be used for Composite Video or S-Video.*

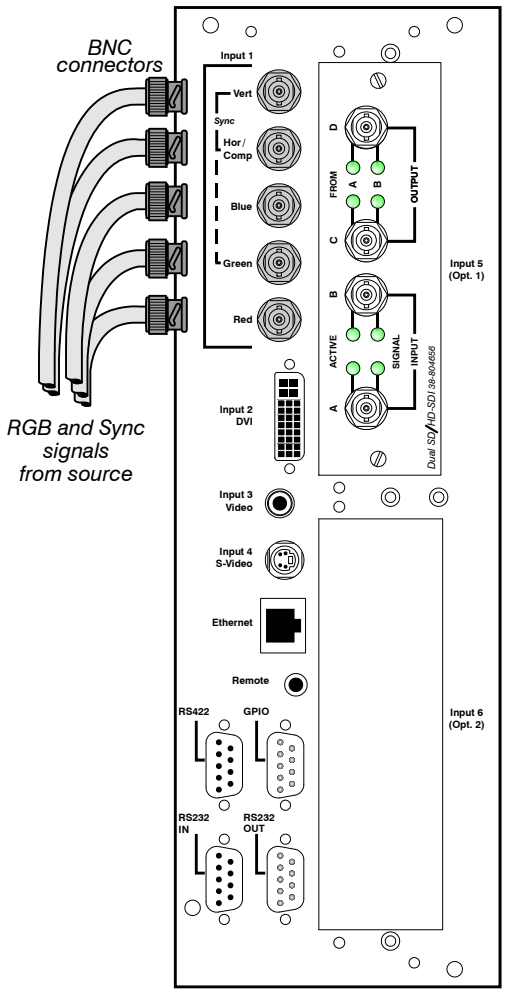

Figure 2-18 Connecting an RGB Source

2.4.2 YPbPr Signals (*Component Video*).

Connect a YPbPr signal (component video) to **INPUT 1** or **INPUT 2** as shown in *Figure 2-19*.

NOTES: 1) *If, for some reason, the projector fails to recognize a YPbPr signal, specify this* ***Color Space*** *option within the Image Settings menu. Refer to* ***Section 3.6.3 Image Settings Menu*** in the ***Roadie HD+35K User Manual***. **2)** *Do not connect digital component signals (known as YCbCr) to* ***INPUT 1*** *or* ***INPUT 2****. Use the appropriate optional digital interface installed in* ***INPUT 5*** *or* ***6*** *only.*

2.4.3 Composite Video

INPUT 3 and **INPUT 4** provide simultaneous connection of both a composite video source (**INPUT 3** and an S-Video source (**INPUT 4**). *Refer to Figure 2-20*.

NOTE: *Unlike previous Christie projectors, composite video and S-Video cannot connect to any other locations on the input panel. Connect as shown in Figure 2-20.*

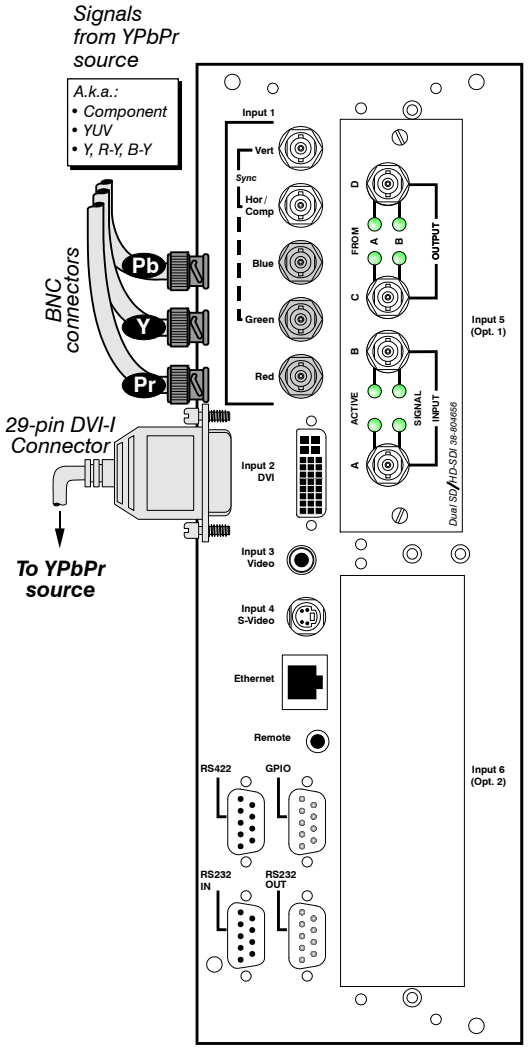

Figure 2-19 Connecting a YPbPr Source

2.4.4 Dual SD/HD-SDI

Christie's Dual SD/HD-SDI module is standard with this projector and factory-installed in the first option slot (labeled **INPUT 5**). Its loop-through capability enables incoming serial digital data (HD format) to be tiled across multiple screens, creating vast "mega resolution" displays. Alternatively, the multiple outputs can be overlapped for extra-bright displays, or simply distributed to additional projectors for multiple screens of the same image.

The module accepts one or two independent standard- or high-definition serial digital inputs, decodes them for processing in the main electronics of the projector, and outputs 10-bit RGB/YCbCr 4:2:2 video. Either input can be set as the active primary or secondary part of a Picture-in-Picture (PIP) display, and either input can be looped through to one (or both) of the module's BNC outputs.

NOTE: *Selection of these inputs is described in Section 3.2 Using the Built-In Keypad or Remotes.*

Connect a compatible SMPTE 292M or SMPTE 259M-C source(s) to one or both of the inputs located on the left side of the module. The module automatically detects the standard at each input and configure itself accordingly for correct termination of the signal. The module also detects and supports dual link 292M for SMPTE 372M video standards.

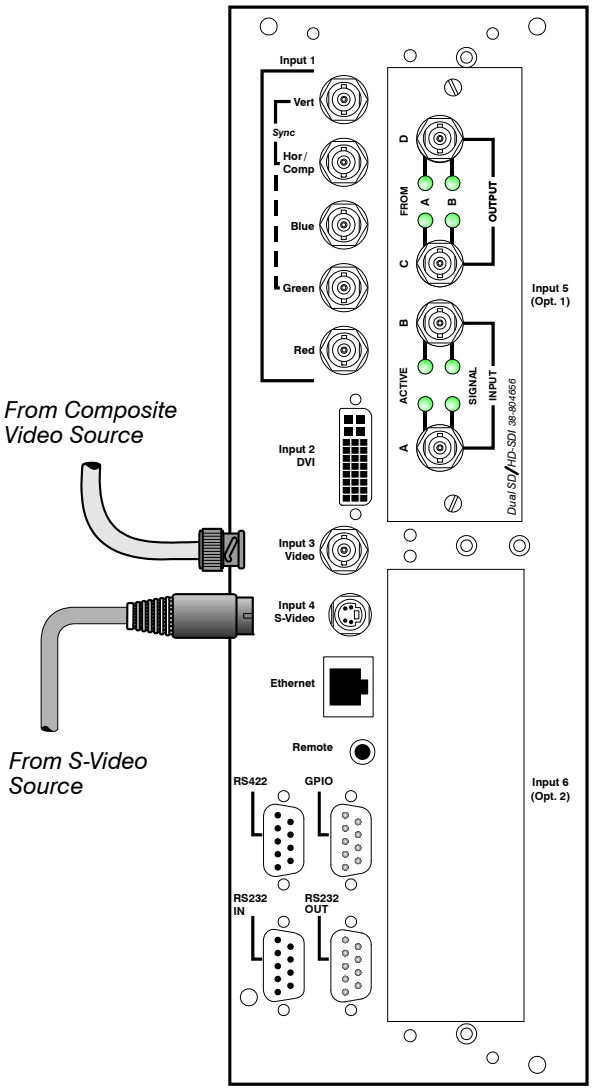

Figure 2-20 Connecting Composite Video and/or S-Video

2.4.5 Extra Video

If you want to use an extra video source in addition to the video source(s) connected at **INPUT 3** or **INPUT 4** connect either a Composite or S-video source to **INPUT 1** as shown.

NOTES: 1) *Do not simultaneously connect Composite and S-video to* ***INPUT 1****.* **2)** *You can switch between video sources connected at* ***INPUT 1*** *and* ***INPUT 3*** *or* ***INPUT 4****.*

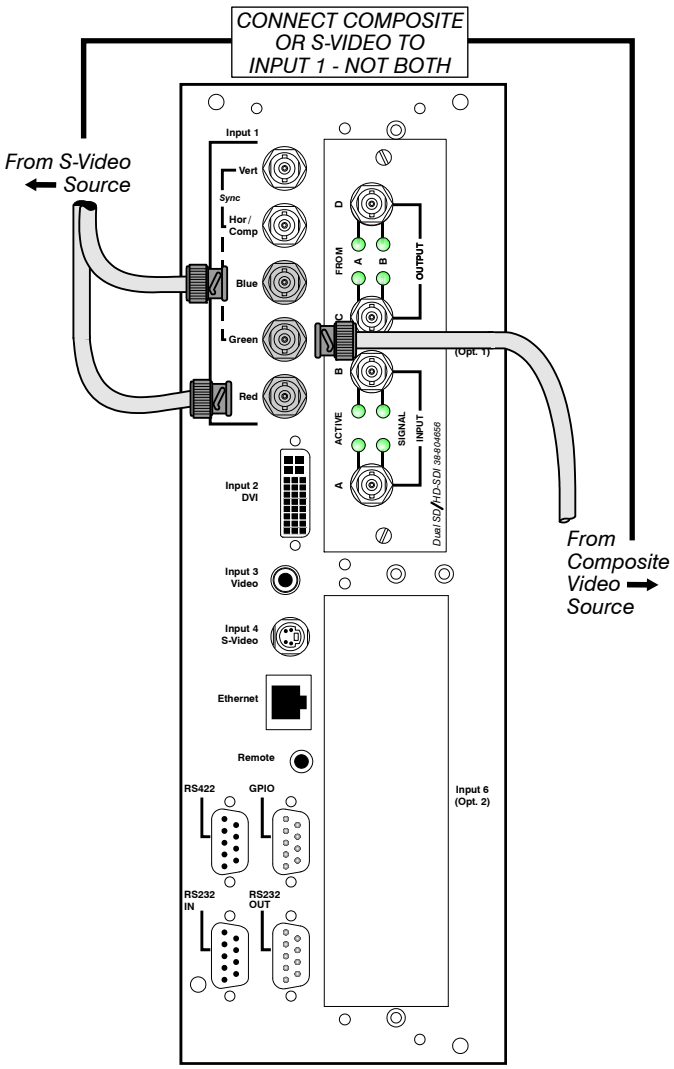

Figure 2-21 Connect Extra Video

2.4.6 Optional Inputs

Optional input modules allow you to increase your total number of inputs and/or accommodate different signal types, whether analog or digital. Install in the areas labeled **INPUT 6** or (if available) **INPUT 5**. These interfaces include:

- DVI Input Module
- Dual SD/HD-SDI Module (supplied as standard in this projector)

For even more sources, connect a third-party switcher to the RS-232 IN port, or, if RS-422-compatible, to any of the two RS-422 ports.

Older input cards not listed may be supported by the Roadie HD+35K.

NOTES: 1) *Connect analog HDTV signals directly to* ***INPUT 1*** *or to any other* ***"****RBG****"*** *input module installed-the optional HDTV Input Module used in earlier projectors is not needed or recommended.* **2)** *See* ***Appendix D: Optional Input Modules*** *in the* ***Roadie HD+35K User Manual*** *for a brief description of each interface.*

2.5 Connecting the Ballast

DO NOT connect the ballast to AC until the projection head and ballast are connected to each other.

⚠ WARNING ***Connect the ballast to the projector FIRST, then connect the ballast to AC.***

2.5.1 Configuring the Ballast for Incoming AC

AC power levels vary from region to region throughout the world, with 400 VAC common in some countries (such as those in Europe and Asia), and 200 VAC common elsewhere (such as in North America and Japan). To accommodate both possibilities, the ballast includes an internal *Input Power Range Switch* for toggling to the level of AC available at the installation site, i.e. either 200 or 400 VAC. The line cord plug must also match.

From the factory, the breaker/power switch and line cord are both set for 200 VAC use. Depending on where they were last used, used/rented lamp power supplies may be set to either, so check the status of the line cord plug and breaker/power switch before attempting to connect to AC. See instructions below (see *Figure 2-22*).

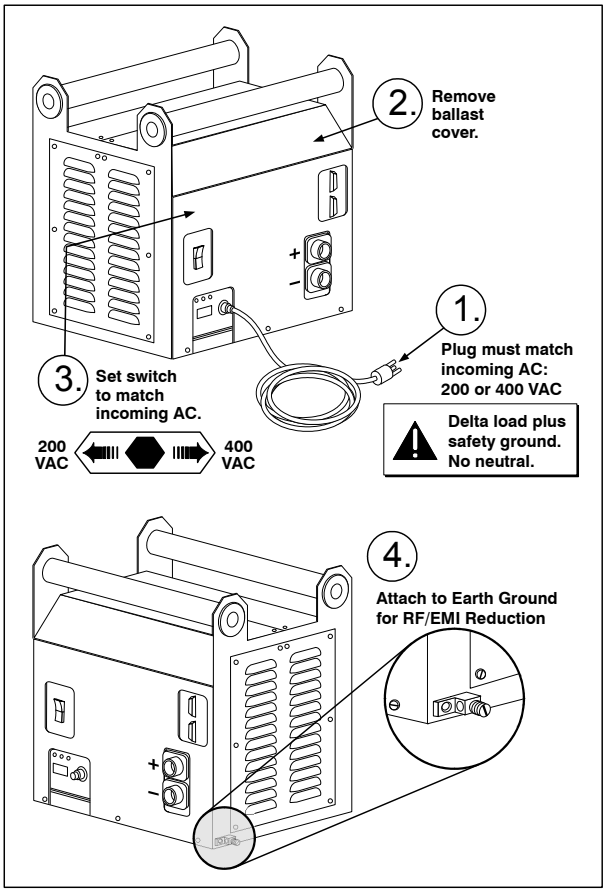

Figure 2-22 Setting up the Ballast

⚠ WARNING ***A Christie accredited service technician is required.***

1. A visual inspection of the plug indicates the status for the 200 or 400 VAC. Change the ballast's plug type necessary for your site, as a delta load with safety ground has no neutral.
2. Remove the ballast cover to access and read the Input Power Range Switch.
3. Toggle the breaker/power switch ***left*** for use with 200 VAC supplies or ***right*** for 400 VAC supplies.
4. Attach the ground lug to Earth Ground.
5. Re-install the ballast cover.

Refer to *Section 2.1.1 Quick Setup* for further details.

2.6 Basic Image Adjustment

NOTE: *Assumes a single projector is powered up in its final location.*

This initial optical alignment procedure is the foundation for optimizing your displays, ensuring that images reflected from the DMDs are parallel to and well-centered with both the lens and screen. It should be completed before adjusting the lens boresight.

Before you begin:

Properly position the projector relative to the screen (refer back to *Section 2.2 Projector Position and Mounting*).

Basic Optical Alignment Procedure

1. Display a test pattern appropriate for analyzing image focus and geometry, such as a single crosshair centered across the image.
2. **Course focus**. Do a quick preliminary (center) focus and (if available) zoom adjustment with the primary lens only. *Refer to* ***Section 3.14 Working with the Lenses*** in the ***Roadie HD+35K User Manual***.
3. **Center the image in the lens**. Holding a piece of paper (full white field) at the lens surface, adjust offsets until the image on the paper is centered within the lens perimeter.
4. **Re-check side-to-side levelling**. With a test pattern on screen, double-check projector leveling (refer to *Section 2.2 Projector Position and Mounting*) so that the top edge of the image is parallel to the **top edge** of the screen.

3 Operation

This section describes how to use the controls and switches for basic projector operation once it is properly installed, aligned and configured by a Christie accredited service technician, as described in *Section 2 Installation and Setup*.

⚠ WARNING **Refer to** *Section 1.1 Safety Warnings and Guidelines*.

3.1 Projector Basics

Primary Roadie HD+35K components are:

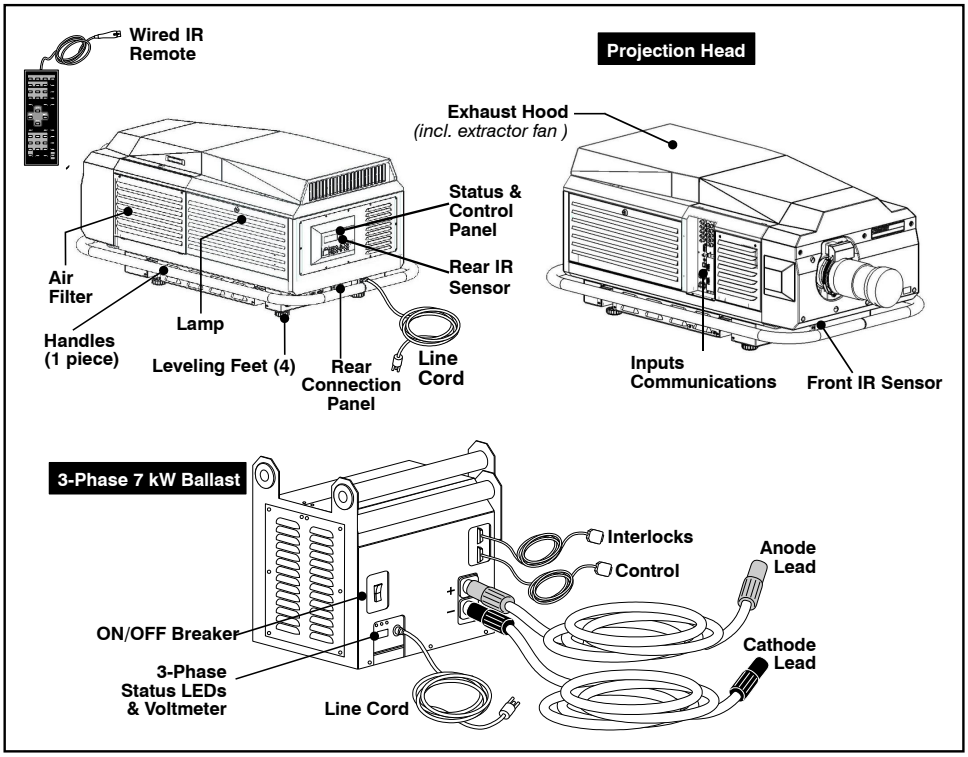

Figure 3-1 Basic Roadie HD+35K Projector and Related Components

3.1.1 Air Filter

Intake air flows through the filter before circulating in the front compartment to cool main electronics. Replace the air filter whenever the lamp is replaced, or sooner in dusty/dirty environments. Refer to ***Section 4.2 Replacing the Lamp & Filter*** in the ***Roadie HD+35K User Manual*** for complete instructions.

IMPORTANT! *Check condition monthly.*

3.1.2 Breaker/Power Switch (ON/OFF)

The breaker/power switch on the ballast serves two purposes:

1) It is a breaker/power switch for the Roadie HD+35K ballast.

2) It protects against over-current conditions of 50A or more.

The breaker/power switch must be ON in order to enable normal Roadie HD+35K system power-up and operation. If faulty or major excessive AC is detected, the breaker "trips" to OFF in order to prevent damage. Try switching the breaker/power switch ON again. If the breaker/power switch continues to trip OFF, this indicates a major fault, and the AC problem must be resolved. Possible causes might include shorts, damage to lamp cables, or very excessive AC.

NOTE: *You must press* POWER *on the built-in keypad as this breaker/power switch does not power up the projector or start the lamp.*

The ballast's internal fan indicates whether or not the breaker/power switch is ON. There is no other indicator. Lights on the ballast indicate only that the ballast is plugged in.

3.1.3 Control Panel (Rear of Projector)

The rear control panel includes the built-in keypad, IR sensor, 2-digit status/error code display window, and the LCD status display, as described in *Table 3.1*.

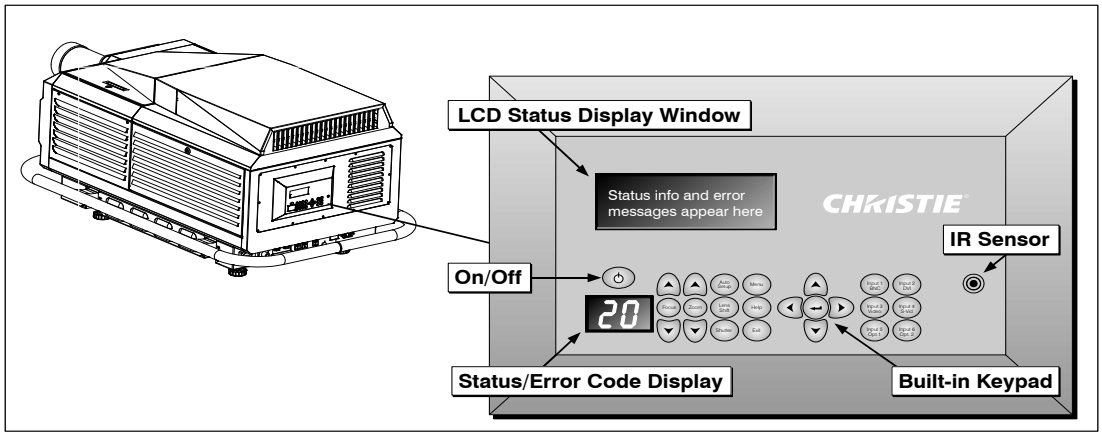

Figure 3-2 Rear Control Panel

Table 3.1 Rear Projector Control Panel

Control Panel Area	Description
Built-In Keypad	Provides access to all software controls needed for working with the projector. For more convenient functionality, you can use a remote, web browser, or a serial message-based method of control.
IR Sensor	Sensors at the front and rear of the projector detect commands from the standard IR remote.
Two-Digit Status/Error Code Window	The code that displays in this window indicates the basic operational state of the projector. Each code references its corresponding status/error message and displays it in the *LCD Status Display* window. See **Section 3.4.1 System Warnings/Errors**.
LCD Status Display	Full status and error messages appear in this window.

3.1.4 Handles

Mounted to the bottom of the projector is the handles assembly, which allows for transportation of the projector over a short distance. The handles can also be used to hoist a single projector only. For rigging purposes, the weight of the projector must not exceed 435 lbs. (197.3 kg.) including the handles.

NOTE: *Any overhead suspension used MUST be suitably rated for the weight of the projector.*

Installations which require the stacking of projectors must use the FredFrame™. The handles assembly must first be removed to expose the projector's channels, and allow for installation of the FredFrame™.

3.1.5 Channels for FredFrame™

An adjustment mechanism (part of Christie's FredFrame™) that is inserted and secured into the channels located under the projector, enables the projector to be hoisted, flown, and/or stacked. Consult complete installation instructions supplied with the FredFrame™ Kit.

3.1.6 Security Locks

Critical internal components and/or connections are protected by standard medium-security locks. This safeguard helps ensure access by authorized personnel only. Remaining panels are not removable with standard tools, or they are blocked by other obstacles that prevent theft or tampering.

3.2 Using the Built-In Keypad or Remotes

The projector is typically controlled using one of the following:

- **The built-in keypad** (*Figure 3-3*) located at the rear of the projection head
- **The standard IR remote** (*Figure 3-4*) wired (includes a 100 ft. cable) or wireless control up to 100 feet

While the built-in keypad or standard remote provides complete control of the projector, they differ slightly in their arrangement of keys and in what functions can be accessed directly with a key press, rather than requiring use of the Menu system. You may find the built-in keypad or the standard IR remote more convenient for your specific installation and application.

3.2.1 Built-in Keypad

To control the projector when signals from a standard IR remote cannot reach the projector, you can use the projector's built-in keypad, located at the rear of the projector. Two nearby windows provide feedback indicating current status and activities of the projector. Because the built-in keypad has fewer keys than the standard IR remote, certain projector functions are accessible only through the *Menu* system.

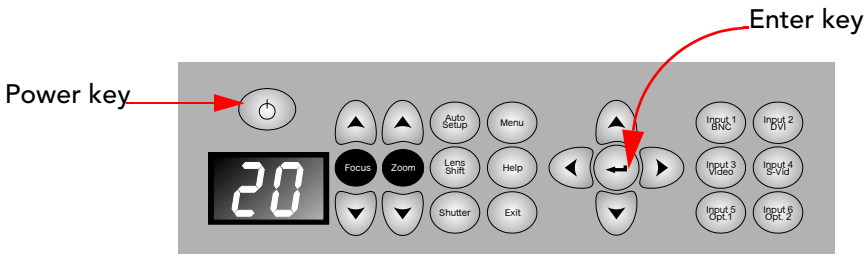

Figure 3-3 Built-in Keypad at Rear of Projector

3.2.2 Standard IR Remote and Transmission

The Roadie HD+35K comes with a standard IR remote which controls the projector by way of wireless communication from a battery-powered infrared (IR) transmitter. Use the standard IR remote the same way you would use any remote supplied with a TV or DVD player.

When pressing any key, ensure that you direct the remote either toward the screen or toward the front or rear of the projector. One of the two IR sensors on the projector detects the signals and relays the commands for internal processing.

Refer to the key descriptions provided for the standard IR remote (*Figure 3-4*).

3.2.3 Wired IR Remote

Should you require a wired connection, use the cable (100 ft. cable supplied) to connect to the 3-pin XLR jack connector (*Figure 3-4*) located at the rear of the projector. You also need to set the proper internal jumper settings accordingly. The wired standard IR remote is recommended when:

- The rear built-in keypad is inaccessible
- The lighting conditions are unsuitable for proper IR transmission

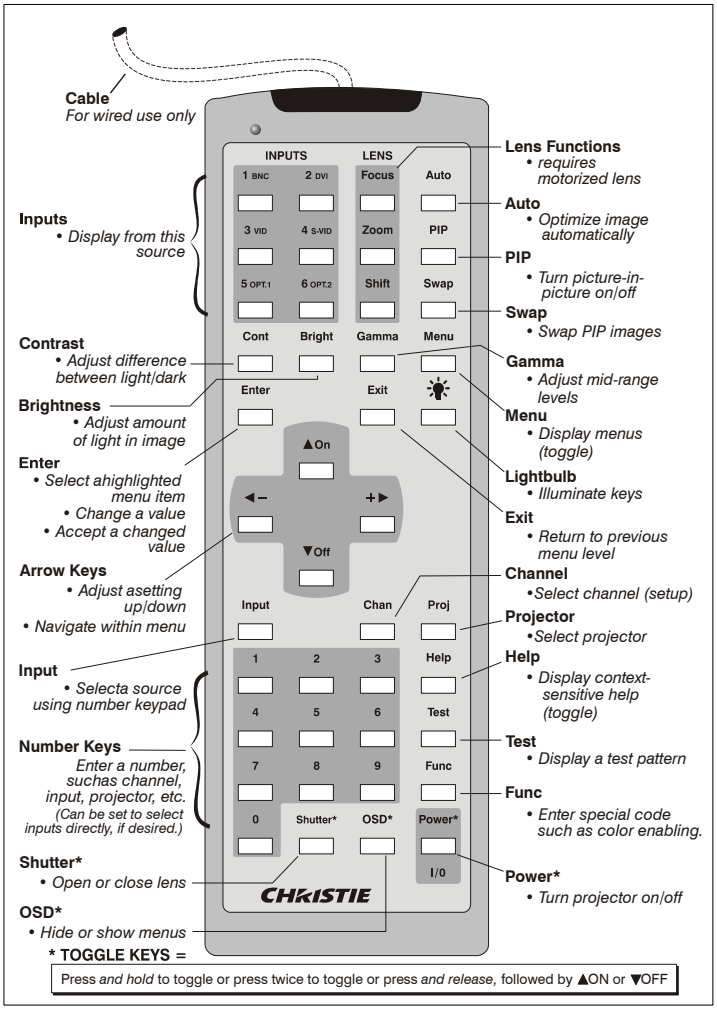

Figure 3-4 Standard IR Remote Keypad

3.3 Power-up Procedure/Checklist

NOTE: *This is a typical manual power-up procedure. Some installations may include an automation system that controls projector start-up and lamp ignition in conjunction with other variables such as lighting, audio and other equipment.*

⚠ WARNING ***Do not attempt operation if the AC supply is not within the specified voltage range.***

The following steps provide a checklist of steps for the Power-up procedure:

1. Make sure that ballast is properly configured for the AC at your site, and that it is connected via 4 cables to the projection head. See *Section 2.5 Connecting the Ballast*.

   At this point, the projection head is in "standby" mode only. The voltmeter displays the incoming voltage, the adjacent main PROJ. STATUS light yellow, and the light engine compartment fans running. The rest of the projection head should be OFF.

2. Connect the ballast's integral three-phase 30-amp line cord to your AC supply according to your site.
3. Confirm the ballast's three-phase status lights are ON and the adjacent voltmeter displays an acceptable AC level for your ballast, and region. See *Section 5 Specifications* for details.
4. Set the breaker/power switch to ON. Listen for the internal cooling fan to start-up.

NOTE: *There is no other indication of whether the ballast is ON or not.*

5. Press MENU. The Status Display at the rear of the projector displays a "Lamp Size" of 2000, 3000, 4500 or 6000 watts, depending on its last setting (factory default=6000). Enter the **Lamp password**.

NOTE: The *password is required unless the "Enable Password" service option has been turned OFF.*

6. Press POWER and use the UP ARROW to locate, and select which lamp is currently installed.

   When the Status Display shows the correct lamp type, the projector, and lamp can be switched ON.

7. Press and hold the POWER button to turn the projection head ON and ignite the lamp. The main PROJ. STATUS light at the rear of the projector should be green when the projector is up-and-running. For best results, let the projector warm up for about 5 minutes.

If the Lamp Does Not Ignite, check:

- If a safety interlock switch is open (such as when the lamp door is ajar), the lamp cannot be struck. The PROJ. STATUS light on the rear of the projector glows red, and an error appears on the status display, and LCD window.
- If the lamp fails to ignite even though the interlock system is OK, the projector automatically tries to re-ignite using 100% of the maximum power acceptable for the installed lamp. If this re-try fails, the lamp likely needs replacement.

NOTE: *For complete power-up troubleshooting, Refer to 5 Specifications.*

8. In the *Lamp* menu, set the "Cable Length (m)" to match the length of the DC cables currently connected between your ballast and projection head.

For more information, see *Section 2.1.1 Quick Setup*.

3.4 Power-down Procedure

NOTE: *Describes a manual shutdown only. May be automated.*

1. Do one of the following to turn the projection head and lamp off:
   - Press POWER twice quickly
   - Press and hold POWER
   - Press POWER + the DOWN Arrow key

NOTE: Continue running all fans, including the heat extractor to cool the lamp for approximately 10 minutes.

⚠ WARNING *Make sure to wait for the fans to cool!*

2. Turn the breaker/power switch **OFF**.

3.4.1 System Warnings/Errors

When the projector encounters a system malfunction, either a System Warning message or a System Error message may appear. Both types of messages are accompanied by a numerical error code on the "Status" LED and a related text message in the LCD Status Display window. A system malfunction can be cleared by pressing EXIT twice from the presentation level, but may indicate the need for service by a Christie accredited service technician.

NOTE: *System messages appear on-screen only if* ***Display Error Messages*** *has been set to* ***"****Screen****"*** *or* ***"****All****"***.

For more information, see ***Section 3.15*** of the ***Roadie HD+35K User Manual***.

4 Troubleshooting

If the projector does not appear to be operating properly, note the symptoms and use this section as a guide. If the problem cannot be resolved, contact your dealer for assistance.

NOTE: *A Christie accredited service technician is required when opening an enclosure to diagnose any "probable cause".*

4.1 Power

4.1.1 Projector Does Not Power ON

Check for the following:

- Check the switch on the AC receptacle. If it is in the **A+B** position (right) there must be two line cords connected (one of which is not provided) in order to operate in this state.
- Ensure the display backlight and the LEDs on the built-in keypad are functioning, and if the menu displays. If the built-in keypad is not functioning, it may need to be replaced.

4.2 Lamp

4.2.1 Lamp Does Not Ignite

Check for the following:

- Is there an interlock failure? From the *Status* menu, check the *Alarms* and *Interlocks* secondary menu. From the web user interface, check the *Status: System* menu.
- If there is any indication through the *Status* menu of a ballast communication problem, re-boot the projector and try turning the lamp ON again.
- If a DMD temperature is too high, the lamp will not ignite. Cool the projector and try again. Ensure there is proper ventilation. If an optional exhaust is used, ensure it has adequate airflow.
- If the lamp does not ignite after the second attempt, replace the lamp.
- Listen for a “clicking” noise to indicate the ballast is attempting to strike the lamp. If not, it may indicate a problem with the ballast (a Christie accredited service technician is required to resolve the issue).
- If you hear a brief “click”, but no light appears, the lamp likely needs replacement.

4.2.2 Lamp Suddenly Goes OFF

Check for the following:

- Check lamp power through the *Lamp* menu or web user interface *Advanced: Lamp* menu. Try increasing lamp power.

NOTE: *Older lamps may not reliably operate at significantly lower than rated power.*

- The DMDs may be overheated. Check for an alarm condition.
- An interlock may be interrupting lamp function.
- If none of these checks resolves the issue, the lamp likely needs replacement.

4.2.3 Flicker, Shadows Or Dimness

Check for the following:

- Ensure the shutter is open.
- LampLOC™ may need re-adjustment.
- LampLOC™ may be in the middle of its adjustment. Wait approximately 2-3 minutes.
- Adjust LampLOC™ motors manually, via the *Main* menu. Confirm all stepper motors are operational by watching on screen with a full white test pattern while adjusting.
- Increase lamp power, if possible. Lamps which are near end of life may not operate reliably at lowest power range.
- Fold mirror misalignment (a Christie accredited service technician is required to resolve the issue).

4.2.4 LampLOC™ Does Not Seem to Work

Check for the following:

- If the *Do Auto* LampLOC™ function does not work, try adjusting the lamp position manually, via the *LampLoc>Manual Adjust* menu. Observe screen brightness by adjusting the XYZ values or use a light meter to check for changes in brightness.
  - Use a Minolta™ T10 illuminance meter (hand-held): Position meter in center of screen to take reading.

Or

  - Use a Minolta™ LS-100 luminance meter: Point the lens at the center of the screen to take a reading. Retake the reading each time an adjustment is made.
- Always adjust XY values before adjusting Z values. Repeat XY adjustments any time Z is adjusted. If brightness levels are not changing when adjusting the XYZ motors it is likely 1 of the motors is damaged, the stepper driver board has malfunctioned or there is a faulty connection.

4.2.5 LiteLOC™ Does Not Seem to Work

Check for the following:

- Ensure LiteLOC™ is set and enabled in the *Lamp* menu.
- If the lamp power has reached its maximum setting, the light intensity reading still cannot meet the target; however, it appears it is not functioning. For example, if the lamp power range is from 1kW (light intensity reading 4000) to 3kW (light intensity reading 6000) and the light intensity is set to 10,000 it will never find the maximum lamp power level because the light intensity is set too high. In this case, simply reduce the LiteLOC™ value within (4000, 6000).

4.3 Calibrating the Lens Mount

The lens mount must be calibrated when:

- a new lens has been installed
- the lens mount has been replaced
- lens settings are drifting within a short period of time

⚠ CAUTION **Lens calibration must be performed each time a new lens is inserted or after performing manual lens mount adjustments. To calibrate the lens, select the *Configuration > Diagnostics and Calibration > ILS Calibration > Reference Calibration* option from the Main menu. This is critical to the projector functioning properly. Failure to do so could result in damage to the lens mount, the projector, or the projection lens.**

4.4 Built In Keypad

4.4.1 Projector ON, but No Backlight on Built-In Keypad

Check the following:

- Confirm the harness is plugged into the back of the built-in keypad (accessible via the lamp compartment door).
- Touch any key. The backlight for the displays and keys should be present.

4.5 Image Displays

The following troubleshooting entries assume the use of a third-party input source. Before proceeding, consult the documentation supplied with the external equipment.

4.5.1 Blank Screen, No Display of Image

Check the following:

- Confirm all connections are OK.
- Ensure the lens cap is not on the lens.
- Ensure the shutter is OPEN. Press SHUTTER OPEN on the standard IR remote or built-in keypad to open.
- Ensure a full black test pattern **IS NOT** selected for display.

4.5.2 Severe Motion Artifacts

Most likely there is a synchronization problem with reversed 3-2 drop-down in 60Hz-to-24Hz film-to-digital conversion in your source. The display file needs correction.

4.5.3 Image Appears Vertically Stretched or 'Squeezed' into Center of Screen

Source data converted from film and "pre-squeezed" for Roadie HD+35K display format may require use of an anamorphic lens (or resizing) to regain full "scope" image width and proper proportions.

4.5.4 The Projector is ON, but There is No Display

Check the following:

- Ensure the lens cap is not on the lens.
- Ensure shutter is OPEN.
- If the lamp is not ignited, press *Lamp ON* from the standard IR remote or built-in keypad.
- Ensure AC power is connected.
- Is an active source connected properly? Check the cable connections and ensure the alternative source is selected.
- Can you access test patterns? If so, check source connections again.

4.5.5 The Display is Jittery or Unstable

Check the following:

- If the image display is jittery or blinking erratically, ensure the source is properly connected and of adequate quality for detection. With a poor quality or improperly connected source, the projector will repeatedly attempt to display an image, however briefly.
- The horizontal or vertical scan frequency of the input signal may be out of range for the projector.
- The sync signal may be inadequate. Correct the source problem.

4.5.6 The Display is Faint

Check the following:

1. The source may be double terminated. Ensure the source is terminated only once.
2. The source (if non-video) may need sync tip clamping.

4.5.7 The Upper Portion of the Display is Waving, Tearing or Jittering

This can occur with video or VCR sources. Check your source.

4.5.8 Portions of the Display are Cut OFF or Warped to the Opposite edge

Resizing may need adjustment. Adjust until entire image is visible and centered.

4.5.9 Display Appears Compressed (Vertically Stretched)

Check the following:

- The frequency of the pixel sampling clock is incorrect for the current source.
- Sizing and positioning options may be adjusted poorly for the incoming source signal.

- Use an anamorphic lens for typical HDTV and anamorphic DVD sources that have been re-sized and vertically stretched, via 3rd-party software.

4.5.10 Data is Cropped from Edges

To display the missing material, reduce image size to fill the display area available in the projector, then stretch vertically to fill the screen from top to bottom. Add the anamorphic lens to regain image width, if required.

4.5.11 Display Quality Appears to Drift from Good to Bad, Bad to Good

Check the following:

- The source input signal may be of low quality.
- The H or V frequency of the input may have changed at the source end.

4.5.12 Display has Suddenly Froze

If the screen blacks out inexplicably, it is possible excessive voltage noise on the AC or ground input has interrupted the projector's ability to lock on to a signal. Power down and up again.

4.5.13 Colors in the Display are Inaccurate

The color, tint, color space and/or color temperature settings may require adjustment at your input source, or in the projector.

4.5.14 Display is Not Rectangular

Check the following:

- Check leveling of the projector.
- Ensure the lens surface and screen are parallel to one another.
- Ensure the keystone setting is properly set.

4.5.15 Display is “Noisy”

Check the following:

- Display adjustment at the input source may be required. Adjust pixel tracking, phase and filter. Noise is particularly common on YPbPr signals from a DVD player.
- Ensure the video input is terminated (75Ω). If it is the last connection in a loop-through chain, the video input should be terminated at the last source input only.
- The input signal and/or signal cables carrying the input signal may be of poor quality.
- If the distance between the input source device and the projector is greater than 25 feet, signal amplification/ conditioning may be required.
- If the source is a VCR or off-air broadcast, detail may be set too high.

5 Specifications

This section provides detailed Roadie HD+35K specifications. Due to continuing research, specifications are subject to change without notice.

5.1 Display

5.1.1 Panel Resolution and Refresh Rate

Pixel format (H x V) on 3 DMDs	2048 x 1080
Refresh rate, 2D displays	23.97 - 65 Hz
Refresh rate, frame-doubled 3D	23.97 - 96 Hz
Input-to-Image Delay	2 frames +30 lines (if locked to input) 3 frames (no timing restrictions)

5.1.2 Achievable Brightness

Typical output using CDXL lamps:

- If 2.0 kW lamp: 12,000 ANSI lumens (13,000 Center lumens)
- If 3.0 kW lamp: 18,000 ANSI lumens (19,500 Center lumens)
- If 4.5 kW lamp: 27,000 ANSI lumens (29,000 Center lumens)
- If 6.0 kW lamp: 32,500 ANSI lumens (35,000 Center lumens)

5.1.3 Achievable Contrast Ratio

With CDXL lamp and standard optical aperture installed:

- With standard high-brightness lens: 2000:1 full field
- With optional high-contrast lens: 2800:1 full field

5.1.4 Colors and Gray Scale

Default color temperature	6500K +950K/-650K
Range of color temperature adjustment	3200K - 9300K
Displayable colors	1.1 billion
Gray scale resolution	10 bits each per RGB component

5.1.5 Gamma

Adjustable from 1.8 - 2.8 (default = 2.2 ± 0.4)

5.2 Lenses

IMPORTANT! **For proper placement in any installation, use the lens and screen size to calculate the precise throw distance using the tables provided in the Dealer Section of the Christie Website, PN 020-100395-xx. In addition, please keep in mind that due to lens manufacturing tolerances for lens focal length, actual throw distance can vary ±5% or more between lenses described as having the same throw ratio.**

5.3 Inputs

Total number of standard inputs 6 *(including Dual SD/HD-SDI).*

NOTE: *Not applicable with all models.*

- Analog: RGB / YPbPr (5 BNCs at INPUT 1)
- Analog: Video (INPUTS 3 and 4)
- Analog: Sync (Interlaced or Progressive Scan Format)
- DVI-I (INPUT 2)
- Dual SD/HD-SDI (INPUT 5 or 6, Standard with Projector)

5.4 Control

5.4.1 Wired Remote (Converted from IR Remote)

2 inputs on projection head	• 3-pin XLR connector (rear) • 3.5mm phono jack (side)
Input levels	• High = 2.2 V – 5.6 V (or open) • Low = -0.6V – 0.9V @ 1mA
Voltage output	+5VDC ±5%
Current output	100 mA nominal, 250 mA max.
Cable length	25 ft.

5.4.2 IR Remote

Number of IR sensors on projector	2 (front and rear)
Wavelength of peak sensitivity	1000 nm (approx.)
Modulation (carrier) frequency	38 kHz (nominal)
Encoding method	bi-phase
Range	100 ft.
(using optional “lite” remote)	50 ft. min.

Assumes no fluorescent lighting interference.
If range appears limited, shield the IR sensor, turn off lights, or change your fluorescent ballast.

5.4.3 Ethernet

Number of ports	1
Standard	100Base-TX
Connector type	RJ-45
Max. baud rate	115200

5.4.4 RS-232 Serial Input

Number of connectors	2
Connector type	9-pin subminiature D (female=in, male=out)
Max. baud rate	115200

5.4.5 RS-422 Serial Input

Number of connectors	2
Connector type (side input panel)	1 x 9-pin subminiature D
Connector type (rear connector panel)	1 x 6-pin XLR
Max. baud rate	115200

5.4.6 GPIO Input

Number of I/O lines	7, each assignable as input or output
Connector type	9-pin subminiature D (male)
Type of connection	Dry contact
Output sink current *(logic low)*	100 mA @ 1V
Maximum power output	+12VDC @ 200 mA **NOTE:** *Shared with 9-pin RS422 port.*

5.4.7 Control Port (From Ballast)

Number of connectors	1
Interface	RS232
Connector type	9-pin subminiature D (male)

5.4.8 Ballast Ports

Number of connectors	1
Interface	+5V TTL-compatible **NOTE:** *Opto-isolated at ballast end.*
Connector type	9-pin subminiature D (female)
Number and type of outputs	1 – lamp enable (low = enable lamp) 4 – safety interlocks (high = disable lamp) 1 – +5VDC for opto-isolated interface

5.5 Power

5.5.1 Projection head

Projection Compartment AC *(near Panel B, at front)*	
Connector type & rating	(1) IEC 320-compatible, 10 A rating
Voltage range, nominal	200 – 240 VAC ±10%
Line frequency, nominal	50 – 60 Hz
AC input rating	10 A
Max. inrush current	35 A
Max. current consumption	3 A
Max. power consumption	700 W
Lamp (DC)	
Max. operating voltage	46 VDC
Max. start-up voltage	155 VDC
Max. current consumption	180 A
Max. power consumption	6600 W
Connector type	Female CAM Lock receptacle (+red) Male CAM Lock receptacle (–black)

5.5.2 7 kW 3-Phase Ballast (38-814001-51)

Input Ratings	200-230 V 3~ +PE, 24 A, 50-60 Hz/380-415V 3~ +N +PE, 16 A, 50-60 Hz
Inrush current (max.) *note: excluding lamp*	<50 A
Power consumption (max.)	14.4 kVA (9.1 kW), all regions
Current rating (continuous) of 3-phase AC input at breaker/ power switch	30 A, all regions
Breaker/Power Switch rating	50 A
Ballast Output to Projection Head	
Operating voltage range	18-46 VDC
Start-up voltage (open current)	125-155 VDC
Operating current range	50-180 A
Ripple	1% max @ 25°C
Control ports	See *5.4.7 Control Port (From Ballast)* and *5.4.8 Ballast Ports* on previous page.

5.6 Lamps

Replace before:

Ballast	CXL/CDXL Lamps (kW)	Lamp Life (hrs.)
3-Phase 7 kW	CXL/CDXL-20 (2.0)	3000
	CXL/CDXL-30 (3.0)	2000
	CXL/CDXL-45 (4.5)	600
	CXL/CDXL-60 (6.0)	600

NOTES: 1) *Current range shown includes "over-drive", which is 10% more than the original lamp rating.*
2) *Optimized brightness requires CDXL lamp.*

Type	Xenolite®
Stand-by lamp power level for 4.5/6.0	60% of lamp's maximum current rating
Stand-by lamp power level 2.0/3.0	75% of lamp's maximum current rating
Motorized adjustment of position	3-axis, 0.25" range for each

5.7 Safety

- CAN/CSA C22.2 No. 60950-1-07, 2nd Edition
- UL 60950-1, 2nd Edition
- IEC 60950-1, 2nd Edition (2005)

5.8 EMC Emissions

- FCC CFR47, Part 15, Subpart B, Class A – Unintentional Radiators
- CISPR 22: EN55022: Class A – Radio disturbance characteristics for Information Technology Equipment (ITE)

5.9 EMC Immunity

- CISPR 24/ EN55024: All parts for immunity characteristics for Information Technology Equipment (ITE)

5.10 Operating Environment

Temperature	10°C to 35°C (50°F to 95°F)
Humidity (non-condensing)	20% to 80%
Altitude	0 – 3000 meters
Tilt, any angle	15° max.

5.11 Non-Operating Environment

Temperature	-25C to 65°C (-13°F to 149°F)
Humidity (non-condensing)	0% to 95%

5.12 Weight & Size

NOTE: 1) *Dimensions exclude lens and cabling.* **2)** *Installed projector weight assumes the heaviest lens, lamp and all accessories are installed.* **3)** *All weights and dimensions subject to change.*

5.12.1 Standard Dimensions

Product dimensions (W x L x H) without lens (including feet at minimum height position) and without handles	1257 mm x 684 mm x 577 mm 49.5” x 26.5” x 22.7”
Product dimensions (W x L x H) without lens (including feet at minimum height position) and handles	1362 mm x 800 mm x 577 mm 53.6” x 31.5” x 22.7”
Packaging dimensions (W x L x H), shipped without lens attached	1650 mm x 1040 mm x 890 mm 65” x 41” x 35”

Shipping Weights

Projection Head	460 lb (209.1 kg)
Ballast	145 lb (66 kg)
FredFrame™	166 lb (76 kg)

Installed Weight

Projection Head	435 lb (197.3 kg)
Ballast	110 lb (50 kg)
FredFrame™	110 lb (50 kg)

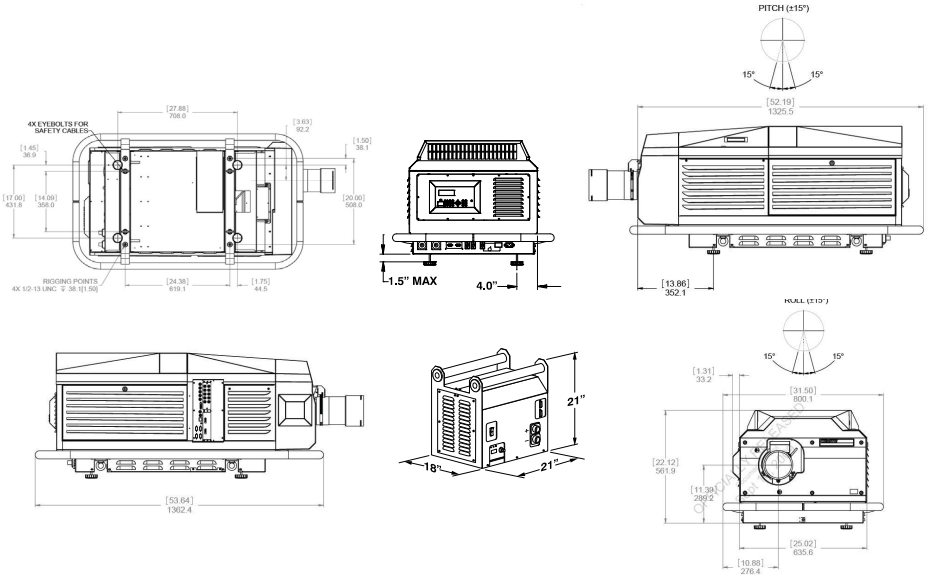

Figure 5-1 Overall Size Dimension

5.13 Standard and Optional Components

5.13.1 Standard (Sold with Product)

- Projection head with built-in keypad and standard IR remote (configured for IR operation, batteries included)
- 25 ft cable for conversion of standard IR remote to wired operation
- Line Cord, 10-foot, 15 amp, North American 220V
- Face shield (required for lamp handling)
- Dual SD/HD-SDI input module *(38-804656-xx)*
- Roadie HD+35K User Manual
- Misc. hardware, including Allen Keys

5.13.2 Optional (Sold Separately)

Projection Lenses

The projection head is compatible with the following optional lenses:

0.8:1 fixed throw ratio lens	113-104106-XX
1:1 fixed throw ratio lens	38-809071-XX
1.25 – 1.45:1	38-809073-XX
1.45 – 1.8:1	38-809074-XX
1.8 – 2.4:1	38-809075-XX

2.2 – 3.0:1	38-809076-XX
3.0 – 4.3:1	38-809077-XX
4.3 – 6.0 :1	38-809072-XX
5.5 – 8.5 :1	38-809078-XX
Motorized Auxiliary Lens Mount	38-813019-XX
1.26x Anamorphic Lens	38-809054-XX
Lamp Power Supplies	
Remote Ballast (7 kW)	38-814001-XX
Ballast (Remote) Cable Kits	
2 meters (6½ ft.)	38-814003-XX
7.5 meters (25 ft.)	38-814004-XX
15 meters (50 ft.)	38-814005-XX
30 meters (100 ft.)	38-814006-XX
Other	
Remote IR Sensor - communication cables	Ethernet, RS-232, and RS-422
Compact/Lite remote	03-900566-XX
Christie TWIST Module for arbitrary image warping and edge blending	108-103001-XX
FredFrame™ Rigging Frame	38-814007-XX
Rigging Clamps for flying projection head by handles	113-102101-XX
10-Bit KoRE Librarian Setup Software	*Website download (password required)*
High-contrast internal aperture kit	38-813028-XX
Analog and Digital Input Modules	See ***Appendix D: Optional Input Modules*** in the ***Roadie HD+35K User Manual***.
Xenon Lamp	2 kW, 3 kW, 4.5 kW, and 6 kW
Service Manual	020-100341-XX

Corporate offices

USA – Cypress
ph: 714-236-8610

Canada – Kitchener
ph: 519-744-8005

Worldwide offices

United Kingdom
ph: +44 118 977 8000

Germany
ph: +49 2161 664540

France
ph: +33 (0) 1 41 21 44 04

Hungary/Eastern Europe
ph: +36 (0) 1 47 48 100

Singapore
ph: +65 6877 8737

Shanghai
ph: +86 21 6278 7708

Beijing
ph: +86 10 6561 0240

Korea
ph: +82 2 702 1601

Japan
ph: +81 3 3599 7481

ISO 9001 ISO 14001

For the most current technical documentation, please visit www.christiedigital.com

CHRISTIE®